



NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

**AN INVESTIGATION INTO PREDICTORS OF HEPATITIS E VIRUS (HEV) AND ITS
PREVENTATIVE STRATEGIES IN WALVIS BAY, ERONGO REGION, NAMIBIA**

by

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**Report presented in fulfilment of the requirements for the degree of Master in Health
Science in the Faculty of Health and Applied Science**


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Date: 15 February 2022

Declaration

I, Justina PL Nghihangwa, hereby declare that the work contained in the thesis entitled: “An investigation into predictors of Hepatitis E virus (HEV) and its preventative strategies in Walvis Bay, Erongo region, Namibia” is my own original work; and that I have not previously in its entirety or in part submitted it at any university or other higher education institution for the award of a degree.

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Acknowledgements

I hereby wish to give thanks to:

- Our heavenly Father who gave me strength, courage and perseverance to carry on in good and bad times to complete this thesis.
- Dr R Mahalie the main research supervisor, for the guidance, manuscript proofreading and helpful suggestions. It was always done with enthusiasm and positive thinking.
- Mr G Jomin my co-supervisor for the inspiration and faith in me to embark on this endeavour and for keeping a watchful eye to see me completing this thesis.
- Walvis Bay Health care workers and the community of Otweya Informal settlement who took part in the study.
- My family for their encouragement and support during the time spent in completion of this dissertation.

Dedication

I dedicate this work to my fiancé Joseph Amushila, my daughter Amor and my sister Johanna who supported me and often had to make sacrifices to allow me to complete my studies.

To my parents for being my pillars of strength all my life.

Abstract

Hepatitis E Virus (HEV), which is a viral liver infection was declared an epidemic in the year 2017 in Namibia. Subsequent to this declaration, the Ministry of Health and Social Services (MoHSS) called for a behavioural change effort in six affected regions in Namibia. Therefore, through this study, predictors such as cultural beliefs, demographics and socioeconomic factors of Hepatitis E virus and its preventative strategies among the Walvis Bay informal settlement residents was determined. The study helped in understanding and identifying perceptions on the predictors of the Hepatitis E virus outbreak among residents in Walvis Bay.

The study employed both qualitative and quantitative methods using an exploratory descriptive design. In-depth interviews (n = 20 health care workers and Hepatitis E virus sufferers) guided by an interview guide was conducted with key informants, structured self-administered questionnaires were distributed to 264 households, and records were reviewed from the Ministry of Health and Social Services, in the Walvis Bay State Hospital's Health Information System (HIS). Quantitative data were analysed using Microsoft Excel of 2016 and Statistical Package for Services Solutions (SPSS) version 26, whereas content analysis was done for qualitative data illustrated through codes and verbatim quotes using ATLAS.ti 9. The correlation of dependent and independent variables was determined using Chi-square tests and one-way Multivariate Analysis of Variance (ANOVA).

The study identified complex cultural beliefs such as eating food with own hands (mean =0.93), washing hands in one bucket (mean =0.67), shaking hands when greeting (mean=0.66) and the use of traditional medicine (mean=0.45). As indicated in the Walvis Bay epidemiological curve, the fluctuation of confirmed cases in each week was observed with the total of 206 cases, majority (57%) being male. Positive associations (p value =3.841) between the identified complex cultural beliefs and the population's socio-demographic characteristics were determined. Finally, the use of traditional medicine, lack of HEV interventions to the affected communities and the socio-demographic factors were identified as the main obstacles to the health care management of HEV in Otweya informal settlement, Walvis Bay.

The results of this current study showed that there are different traditional and cultural practices such as the use of traditional medicine (Oukoreb, Kamaku, Nara !Nomab) and hand hygiene practices (Shaking hands when greeting, washing hands in one bucket of water,

eating with hands without cutlery and eating together in one plate) act as predictors of HEV prevalence in Otweya informal settlement of Walvis Bay. HEV cases were high in the informal settlements and there were positive associations between the socio-demographic of the population and cultural beliefs that would lead to the prevalence of HEV. Based on the results of this study, it is recommended to understand and identify shared main cultural beliefs of the community with health needs for effective interventions to curb and prevent diseases such as HEV at the informal settlements of Namibia. Recommendations were made to assist policy makers to design effective integrated primary health care strategies to serve the communities in informal settlements in Namibia.

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III. Clarification of terms / List of abbreviations

| | |
|--------------|-------------------------------------------------------------------------------------------------------------------|
| ANOVA | Analysis of Variance |
| C/E | Cost Effective |
| Ethnographic | Relating to the scientific description of peoples and cultures with their customs, habits, and mutual differences |
| Hepatitis E | Viral infection that affects the liver |
| HEV | Hepatitis E Virus |
| HIS | Health Information System |
| IBM-WASH | Integrated Behavioural Model for Water, Sanitation and Hygiene |
| MoHSS | Ministry of Health and Social Services |
| OR | Odd Ratio |
| Quotes | Copy out or repeat of words spoken by another person (indicated in inverted commas) |
| SOT | Solid Organ Transplant |
| SPSS | Statistical Package for Services Solutions |
| WASH | Water Sanitation and Hygiene |
| WHO | World Health Organisation |

Chapter 1: Introduction

1.1 Introduction to Hepatitis E Virus

Hepatitis E virus (HEV) is the leading cause of acute viral hepatitis in the developing world (Strategic Advisory Group of Experts on Immunization, 2015). According to Ekanem, Ikobah, Okpara and Udo (2015), the endemic infection is mostly found in Asia, Africa, Central America, and the Middle East regions, where the virus has been known to produce self-limiting acute viral hepatitis with mortality rates of 1% to 3%. Hepatitis E virus is a viral liver infection that is usually self-limiting, but it may develop into fulminant hepatic failure (Marano *et al.*, 2015). This infection is mainly affecting young adults aged 15 to 39 years, with the majority being males and high mortality rates range from 0.1% to 4% in pregnant women (World Health Organization, 2015).

It has been demonstrated in the study conducted by Ekanem *et al.* (2015) that, Hepatitis E virus outbreaks were responsible for 66% and 22% in Chad and Cote d'Ivoire, respectively. Furthermore, the Ministry of Health and Social Services (MoHSS) in Namibia, declared an outbreak of Hepatitis E virus in 2017, in seven political regions (Khomas, Erongo, Omusati, Oshana, Ohangwena, Oshikoto, and Kavango East region), of which over 80% of cases were recorded (MoHSS, 2018).

1.2 Background information of the study

According to Kahissay, Fenta and Boon (2017), over one-third of the population in developing countries lacks access to modern health care services, often relying on traditional medicine or self-care due to physical inaccessibility and unaffordability. Green and Murphy (2014), stated that the beliefs and perceptions of ill-health are influenced by the socio-cultural context and traditional healers who form an alternative health service in many societies. Unfortunately, early humans were unable to develop knowledge about edible materials and natural medicines and it can lead to people consuming poisonous plants which can cause vomiting, diarrhoea, unconsciousness, death, and other toxic reactions (Yuan, Ma, Ye & Piao, 2016). Schweitzer (2020) stated that there are three Hepatitis E virus outbreaks in Namibia since 1983, the largest to date and the first nationwide. During this outbreak, a total number of 2,677 (37%) cases were reported from three of Namibia's largest informal settlements such as Havana and Goreangab in the Khomas Region, and the Democratic Resettlement Community in the Erongo Region (Bustamante *et al.*, 2020).

Modern health care institutions and policies often do not recognize the importance of cultural ill-health beliefs and medicinal knowledge plays in health care, especially in developing countries (Shim, 2010). Therefore, this study aims to determine the contributing factors of Hepatitis E virus and preventative strategies among the informal settlement of the Walvis Bay community.

1.3 Statement of the Problem

A study done by Bustamante *et al.* (2020), indicated that Hepatitis E virus was declared as an outbreak on 14 December 2017 in Namibia. As of December 14, 2017, to February 2, 2020, a total of 7,247 outbreak-associated to hepatitis E virus cases were reported countrywide of which 6,068 (84%) cases were reported from Khomas and Erongo regions, which have large informal settlements (MoHSS, 2018). It was revealed that at least 41% (206) of HEV laboratory-confirmed cases recorded in the recent outbreak were found in the Walvis Bay informal settlement (MoHSS, 2018), indicating that there was a need for understanding the rationale behind the rapid spread of HEV in the community. In another study by Mbonambi (2016), it was showed that the outbreaks in informal settlements were mainly due to the increased rural-urban migration, unemployment, or low-income workers with substandard housing and poor sanitation. These social and environmental conditions have the potential of making communities susceptible to disease outbreaks.

Although there were interventional efforts made in Namibia, no study has been carried out, on the predictors of HEV and its preventative strategies in the community. The unclear understanding on the utilization of the preventative strategies put in place, as well as on the perceptions toward the root causes and the transmission of Hepatitis E virus in Erongo region. Due to the recent outbreak of HEV, the Ministry of Health and Social Services called for a behavioural change effort in the six most affected regions in Namibia (MoHSS, 2018).

Therefore, this study was designed to provide the first community-based insight on the cultural beliefs of the community on the predictors and preventative strategies of Hepatitis E virus.

1.4 Hypothesis

Predictors to Hepatitis E and its preventative strategies can lead to the high number of HEV cases among the Walvis Bay residents.

1.5 Aim of the research

The study aimed at identifying the predictors of Hepatitis E virus and its preventative strategies among the Walvis Bay residents.

1.6 Specific objectives

The specific objectives of this study are to:

- Determine predictors of Hepatitis E virus outbreak among residents in Walvis Bay.
- Establish the association that exists between cultural factors, demographic and socioeconomic, and HEV.
- Identify the obstacles to health care for the management of HEV in the Walvis Bay community.

1.7 Research Question/s

The study will answer the following research questions

1. What are the predictors of the Hepatitis E virus outbreak among residents in Walvis Bay?
2. What is the association between cultural factors, demographic and socioeconomic, and HEV?
3. What are the obstacles to health care for the management of HEV in the Walvis Bay community?

1.8 Significance of research

The following are the significances of this study:

1. The study will help provide reliable baseline data on parameters related to HEV, which has been unavailable.
2. Information about the cultural beliefs and practices of informal settlement residents should assist policy-makers, program administrators, and others in the development field to develop effective programs of public health education to contain the spread of the disease.
3. The findings of this study may also contribute to interventions for improving patients' knowledge of the disease, and consequently improve the treatment success rate.
4. The research output may be published in peer-reviewed journals, thus adding to the body of knowledge.

1.9 Chapter summary

This chapter presented a general introduction to the study. It begins with the definition of Hepatitis E virus, followed by the background information to the study, a statement of problems, research questions, aims, and objectives, and the significance of the study.

Chapter 2 sets out the literature search strategy followed by a detailed description of the theoretical basis for the present study. A review of literature related to the independent and dependent variables is then presented, including related studies that address the association between independent and dependent variables.

Chapter 2: Literature review

2.1 Introduction

According to Goodson and Vassar (2011), ethnographic studies are crucial in health care systems, in identify health behaviours and provide targeted interventions to those affected by HEV. Airhihenbuwa, Ford and Iwelunmor (2014) believes that all cultures have disease theory systems that include attributional concepts to explain illness causality. The effect of cultural systems of values on health outcomes is huge across cultures in multicultural settings and within the cultures of institutions established to advance health (Napier et al., 2014). Due to the lack of awareness of cultural traditions and beliefs in the health practitioners the successful delivery of health care in a multicultural setting is often hampered (Renzaho, Romios, Crock and Sønderlund, 2013).

Understanding of health problems and their causes differ from community to community, society to society within the community, from religion to religion, and from culture to culture (Chukwuneke, Ezeonu, Onyire and Ezeonu, 2012). Therefore, new approaches on the cultural factors that affect health-improving behaviour are needed to give directions on how to address the interplay between culture and health. Consequently, the World Health Organization (WHO) advises that communication and community engagement be conducted; before, during, and after an infectious disease outbreak, to identify behavioural and social actions that may contribute to the spread of the disease (World Health Organization 2014).

2.2 Theoretical framework

Based on Stone, MacDonald and Butera, (2012), it was understood that culture refers to the conventional understandings manifesting in an act and artefact. People in different cultures have different concepts that influence many aspects of individuals' life experience including illness and expectations toward recovery (Kpanake, 2018).

Cultural concepts that come into the picture are cultural values and ways of life, religious factors, social factors, economic factors, and technological and educational factors (Turaev, 2020). The study conducted by Chukwuneke *et al.* (2012) found out that people seek health care based on their cultural preferences and the traditional African healers look for the cause of the patient's misfortune in the relationship between the patient and the social, natural, and spiritual environments. The way people perceive, interpret, and respond to suffering is

mediated by both cultural and social contexts as well as the illness and a disorder itself. Consequently, community understanding of diseases and their spread is complex, context-dependent, and culturally mediated (Dinos, Ascoli, Owiti and Bhui, 2017). This study is, therefore, unearthing the healthy cultural beliefs of the community of Otweya informal settlement in Walvis Bay, which can lead to the prevalence of HEV.

2.3 Modes of transmission of HEV

Ricci *et al.* (2017) opined that HEV is mostly transmitted via contaminated drinking water (HEV-1 and HEV-2) or contaminated food (HEV-3 and HEV-4), however, human-to-human transmission has been sporadically observed through transfusion or transplantation treatments. In addition, Khuroo, Khuroo and Khuroo (2016), postulated that households with cases of hepatitis E virus were more likely to have a member who attended a funeral or washed hands in a common basin with others and less likely to have washed hands after defecation (2016). A comparison was made by Tetey (2019) between the incidences of HEV among individuals whose secondary employment was farm work and those who worked at home or were unemployed and a significant increase of (95%) was found indicating that males were more likely to be anti-HEV seropositive than females, across all age categories (2019).

Furthermore, Cruz, De Paula and Villar (2018), found out that the majority of respondents (>74%), are aware of Hepatitis A–C, while 60.8% of the respondents, indicated that Hepatitis E virus could be cured and more than 67% did not believe that Hepatitis D and E exist. However, these same authors revealed that poor public perception regarding viral Hepatitis E virus in north and southeast regions of Brazil and the knowledge level was significantly associated with family income, level of education, and city of residence (Cruz, De Paula and Villar (2018). Ofori-Asenso and Agyeman in their study attributed the high levels of HEV infection among Ghanaians to the low level of knowledge and awareness about the transmission pathways of common viral hepatitis in the country (2017).

2.4 Socio-demographic factors and HEV

2.4.1 Socio-economic factors

Napier *et al.* (2014) described that socio-economic status produces new cultures defined by degrees of social security and limitations on the choice that privilege some people and disadvantage others. Financial equity is, therefore, a very large part of the cultural picture (2014). Furthermore, Spearman and Sonderup (2015), think that where economic limitations

dictate what is feasible, socio-economic status produces its own cultures of security and insecurity that cut across nationality, ethnic background, age, and gender orientation.

Hepatitis E virus presents as a hyper endemic disease in low-resource countries with poor sanitation through faecal contamination of food and water supplies, Khuroo, et al. (2016). Another study conducted in Israel by Mor *et al.* (2015) found that the prevalence of Hepatitis E virus antibodies among those of low socio-economic status was high and the association between a socio-economic factor and the prevalence of HEV was determined. Health-seeking behaviour is a habit of the people of a community that resulted from the interaction and balance between health needs, health resources, and socio-economic and cultural factors, says Adhikari and Rijal (2014). Spearman and Sonderup, (2015) stated that health disparities exacerbated by the limited awareness and preventable mortality and morbidity reflect the differences in the incidence, prevalence, burden of disease, and access to care determined by socio-economic and environmental factors.

2.4.2 Demographic factors

Hepatitis E virus (HEV) is a major cause of acute jaundice worldwide causing outbreaks among the world's most vulnerable populations (Azman *et al.*, 2019). The emergence and transmission of infections are usually linked with several factors such as age, gender, occupation, education level, personal behaviour, poor hygienic condition (safe water and sanitation) lack of infrastructure, economic condition, and cultural custom (Zhou, hang, Zhang and Ma, 2020). In a study conducted on the behaviours of males on Hepatitis E virus, De Schryver, De Schrijver and François (2015) indicated that more males with HEV genotype 3 were linked to the high likelihood of pre-existing differences in dietary preferences and history of high alcohol consumption. The study by Al-Eisa and Al-Sobayel (2012) also found out that factors such as gender, age, and occupational stressors, are likely to influence the outcome of health. Therefore, it is important to understand the factors and personal characteristics that affect the perseverance of health-promoting behaviours to construct effective interventions.

Furthermore, a study on the association between HEV in pregnant women and their educational background indicated that women with college and above educational level have the lowest seropositivity (22%), from all study participants while the odds of pregnant women who have a primary educational status infected with HEV were two times higher than those with college and above education status (Abebe, Ali and Ayele, 2017). In the same study by

Abebe, Ali and Ayele (2017), it was further asserted that the odds of pregnant women aged between 26–34 being infected with HEV is 1.68 times higher than the odds of pregnant women aged above 25 years. Thus, it was concluded that there is a strong association between age and HEV seroprevalence reflecting cumulative lifetime exposure to the virus.

2.5 Obstacles to health care management of HEV

The WHO has also revealed that no established treatment for HEV is available for pregnant women, but only supportive care is provided, and this causes up to 30% maternal mortality associated with fulminant hepatic failure, spontaneous abortion, and stillbirth (World Health Organization, 2017). However, different cultural groups have diverse belief systems with regards to health and healing in comparison to the Western biomedical model of medicine (Newcombe, 2012). Whereas the study by Njoh (2016) stated that cultural practices such as using herbal medicines are common and continues to rise in developing countries especially in rural areas. The use of these medicines has been indicated as a major cause of liver injuries (Amadi and Orisakwe, 2018). Every culture has explored and used plants for medicinal purposes and the use of this medicine used by patients often occurs without the advice or knowledge of their medical practitioner (Al-Zahim, 2013). A different study by Tibiri (2020) on the treatment of liver cancer, showed that, due to limited access to pain medication, patients turned toward traditional medicines derived from plants. Subsequently, the need for the greater dissemination of information in culturally and linguistically appropriate mediums to raise awareness about viral hepatitis, pathogenesis, and available treatments is crucial (Guirgis, Nusair, Bu, Yan and Zekry, 2012).

Furthermore, Nimgaonkar *et al.* provided evidence that commonly used immunosuppressive drugs such as *Tacrolimus* can increase the risk of developing chronic HEV in solid-organ transplant (SOT) recipients (2018). Therefore, the cost-effectiveness (C/E) of the vaccine should be explored (Haffar, Bazerbach and Lake, 2015).

A study by Wilder *et al.*, on the obstacles to a successful liver transplant, indicated that due to the geographic location, insurance, income status, gender, and race/ethnicity differences, the transplantation is mostly not performed, thus equal access to liver transplantation requires improved understanding of how various potentially influential factors such as patient preference, cultural and religious beliefs, and referral patterns contribute to listing and receipt of a liver transplant (2016). Lastly, a study done in Namibia by Schweitzer (2020), revealed that approximately 40% of households in urban areas that are located in informal settlements

have minimal infrastructure, insufficient health education, limited access to latrines and piped water and poor hygiene which is making it difficult to curb the spread of Hepatitis E virus.

2.6 Interventions for the eradication of HEV

2.6.1 Cultural and ethical awareness

The study by Fang and Stewart (2018) elaborated that the health providers, policy-makers, researchers, and community-based organisations need to work together to develop comprehensive intervention strategies to address the cultural factors, traditional health beliefs, and health care challenges that influence obtaining Hepatitis screening and treatments.

2.6.2 Water, Sanitation and Hygiene (WASH) control measures

Assefa and Kumie (2014), reasoned those behaviours of individuals at the individual level are influenced by their knowledge, beliefs, attitudes, and traditions concerning the poor WASH conditions. Research by Gold and Namupolo indicated that the current WASH conditions in Windhoek's informal urban settlements are very poor. The toilet facilities in the informal urban settlements are limited or absent and people utilise a dry sanitation system, forcing most residents to opt for open defecation practices (2013). Apart from that, a study by Aihuki (2020), in the Havana informal settlement in Windhoek stated that, despite the provision of quality drinking water by the City of Windhoek, informal urban settlements experienced inequitable distribution of water points and poor maintenance of existing water taps. Communities are challenged by the cost of water and the distance to and from the water points (Aihuki, 2020).

The study by Yates, Vujcic, Joseph, Gallandat and Lantagne, postulated that effective water, sanitation, and hygiene (WASH) interventions play a critical role in preventing disease outbreaks by breaking transmission routes and provide rapid relief to minimize the impact or spread of disease (2018). In addition, Thomson *et al.* (2013) assert that sustained prevention and control responses such as effective WASH may reduce the morbidity and mortality of HEV, particularly among pregnant women. In another study by Dreibelbis *et al.* (2013), it was recommended that the implementation of the Integrated Behavioural Model for Water, Sanitation, and Hygiene (IBM-WASH) intervention among resource-constrained settings will address the WASH challenges that are experienced by poor communities, such as informal urban settlements.

2.6.3 HEV vaccine

According to the study by Kirkwood, Dobscha and Steele (2020), *Hecolin* is the only known HEV vaccine on market, however, this vaccine is facing a dilemma in global marketing, thus it is unable to play a fundamental role in global Hepatitis E virus outbreaks and pandemics control. Furthermore, Wu, Chen, Lin, Hao, and Liang (2016) study on Hepatitis E virus epidemiology and vaccine showed that Hepatitis E virus remained higher consisted about 50% of the reported acute Hepatitis cases and the ratio had been increasing annually after *Hecolin* licensing.

It is therefore important to understand the chronic and extrahepatic HEV infections and refining promising treatment approaches as this will effectively increase the know-how of the spectrum of responses to HEV infections in both pregnant women, adults, and children (Krain, Nelson and Labrique, 2014). Additionally, more data is needed about the role of the hepatitis E virus vaccine in controlling outbreaks of this disease when added to conventional control measures because a high coverage rate with the vaccine may prevent new infections and interrupt prolonged outbreaks (World Health Organization, 2014).

2.6.4 Health education/community engagement

According to the World Health Organization (2014) on the waterborne outbreak of HEV report, communicating with affected populations and engaging with the surrounding community are critically important steps to help mitigate the threat of hepatitis E virus outbreaks. Therefore, communication and community engagement can identify behavioural and social actions that may contribute to the spread of the disease and should be conducted before, during, and after an infectious disease outbreak (Khan, 2012). Jefferies, Rauff, Rashid, Lam and Rafiq (2018), study specified that awareness campaigns to educate the entire community and implementation of local health measures are of importance on reducing or preventing HEV prevalence. Health education on HEV signs and symptoms, hygiene measures, and health-seeking behaviours information should be given to the outpatients (World Health Organization, 2014).

2.7 Chapter Summary

This chapter presented the pieces of literature reviewed, answering to the objectives of the study. It indicated the importance of ethnographic studies to the health care system, the mode of transmission of HEV, and the association between the socio-demographic factors and cultural beliefs that can lead to the transmission of HEV. The chapter ends with the obstacles

to the health care management of HEV and the interventions to eradicate the virus. Different materials with information relevant to the research study were analysed and organised to cover the objectives of the study.

Chapter 3 presents the research design used to explore the literature gaps identified in chapter 2 of this study. The methodology that includes the definition of the target and study populations and description of the study sample and sampling procedures then follows. This chapter also includes a description of the study dataset, the instruments, and the variables. The chapter ends with a description of the data collection methods and data analysis followed by a description of ethical procedures and a summary of the chapter.

Chapter 3: Methodology

3.1 Introduction

The study by Kumar (2018), described research methodology as the set of actions followed when conducting the study. This chapter provides the sequence of steps followed in this study to respond to the research questions and research objectives, as well as insight into the research paradigm, approach and design followed in the study. It describes the research setting, population and sample selected for the research instrument. The data collection method, analysis of the data, and data management, as well as the ethical considerations related to this study are also explained and described.

3.2 Study design

Research design is a set of methods and procedures used to collect and analyse data in a particular research study (Woodward, 2013). According to Sahin and Öztürk (2019), a mixed method research design approach is defined as a study that include at least one quantitative strand and one qualitative strand. This study adopted a cross sectional study design and both qualitative and quantitative approaches to collect data were used. In this study, an exploratory sequential mixed method was used, therefore qualitative data was collected first and then the quantitative data to explain the relationship among the qualitative data. This method assisted the researcher to discover a phenomenon, identify themes, and develop a data collection tool. Therefore, a descriptive design was coupled with an exploratory design because of its ability to provide a detailed and accurate picture of the phenomena under study.

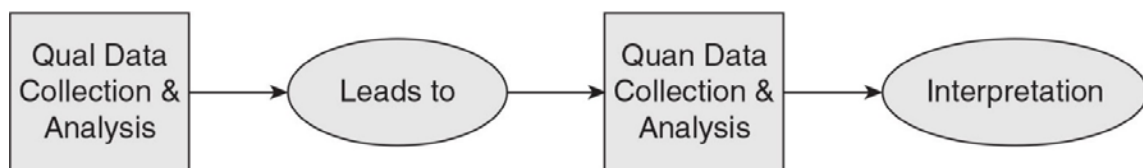


Figure 1: Exploratory sequential mixed method (DeCuir-Gunby, Schutz, 2017)

3.3 Qualitative approach

Qualitative research approach is a process of naturalistic inquiry that seeks an in-depth understanding of social phenomena within their natural setting (Hughes, 2012). Qualitative research is used to gain an in-depth understanding of human behaviour, experience, attitudes, intentions, and motivations, based on observation and interpretation to find out the way

people think and feel (Taylor, Bogdan and DeVault, 2015). The qualitative research approach in this study provided insights and understanding of the predictors on HEV in Otweya informal settlement using different interview guide as presented in annexure D, E and F.

3.4 Quantitative approach

Quantitative research approach refers to a set of strategies, techniques, and assumptions used to study psychological, social, and economic processes through the exploration of numeric patterns (Hughes, 2012). This type of approach is a way to learn about a particular group of people, known as a sample population, quantitatively. The collection of quantitative information allows researchers to conduct simple to extremely sophisticated statistical analyses that aggregate the data (Hughes, 2012). In this approach a descriptive study design which is cross sectional study design was used to generate hypothesis. The researcher in this study strived to maintain objectivity, progressed logically, and followed a series of steps according to the pre-identified plan of action, and used a structured instrument (close-ended questionnaires) to obtain the information, see annexure C. Apart from that, the researcher reviewed records on the number of new cases reported at the Health Information System office at Walvis Bay State Hospital

3.5 Study population

Based on the National Statistics Agency (2011), Walvis Bay town has a population of over 62 000 of which 12,700 reside in Walvis Bay rural and the remaining 49300 reside in Walvis Bay urban. Otweya informal settlement is a small location situated in Kuisebmond location in Walvis Bay District, which made up Walvis Bay rural. The area is comprised of different ethnic groups such as Damara Nama, Aawambo, Otjiherero, Ovahimba, and Kavango.

3.6 Sampling technique

A purposive sampling technique which is regarded as a non-probability sampling method was used to select ten (10) health care workers (five females and five males) who worked with the HEV patients and ten (10) patients (five males and five females) who suffered/ suffering from HEV in Walvis Bay for the in-depth interview. This sampling method was used simply because the researcher wanted people who can and are willing to provide the information by virtue of knowledge or experience on HEV and the researcher identified and selected participants (nurse who work with HEV patients and HEV sufferers) that are proficient and well-informed (Etikan, Musa and Alkassim, 2016). The researcher therefore, proposed a deliberate choice of an informant which is done due to the qualities the informant possesses (Etikan, 2016). Main questions for HEV sufferers in the interview guide were such as cultural

practices and their impacts to the treatment of Hepatitis E, treatment of patients at the health care facilities due to their ethnicity, race, or beliefs and the effects of the financial situation towards the HEV patient's recovery process. Furthermore, main questions for the health care workers who worked with HEV patients were such as main cultural practices of the community when it comes to health care treatment of HEV and the effect of income, age group, gender, ethnicity affects patients on the treatment of HEV patients. Apart from that, a convenience sampling method was used to administer questionnaires per household in Otweya Informal settlement and to those who met the study population criteria. This sampling technique was used because the targeted population is homogeneous, the method is easy, affordable and the subjects of the population were easily accessible and readily available to the researcher (Etikan, Musa and Alkassim, 2016). Variables such as ethnicity, employment status, age, gender, and source of income were part of the questionnaire.

3.7 Sampling frame

The sampling frame was the total number of households per dwelling in Walvis Bay informal settlement and a population that meets the study population definition. At least five hundred and sixty-five (565) households based on the Walvis Bay Municipality Health Section made up Otweya informal settlement.

3.8 Sample size determination

Sample size determination was a critical step in the design of a planned research protocol, and it assures an adequate power to detect statistical significance (Suresh and Chandrashekara, 2012). As such, the following were use in the sample size determination:

Sample size: Some 288 house households were administered with questionnaires. The sample size was calculated using the following formula:

$$N = z^2 pq / d^2$$

$$= 3.84 * 0.25 * 0.75 / 0.0025$$

$$= 288$$

When N is the desire minimum sample, Z is the standard normal deviation usually set at 1.96 at 95% confidence interval, P is the proportion of the population with particular characteristics being studied, Q is 1.0-p, and D is the degree of accuracy usually set at 0.05. The final sample size calculated was two hundred and eighty-eight (288) households.

3.9 Pilot study

The pilot study referred to a small-scale of a complete survey or a pre-test for a particular research instrument such as a questionnaire or interview guide that can be conducted in qualitative, quantitative, and even mixed methods research (Janghorban, Latifnejad Roudsari and Taghipour, 2014). The close-ended questionnaires were pre-tested at Walvis Bay informal settlement and the interview guide were pre-tested and Walvis Bay State Hospital before the commencement of the data collection period. That was done by the researcher to obtain information for improving the study, by discovering the strengths and weaknesses of the study instruments and making any necessary corrections. During the pre-testing exercise, some questions that were not understandable to the community were identified such as the use of natural water disinfectant, commonly cultural practices of the community and the obstacles to access health care services. Therefore, those questions were modified and made clear to the respondents before the survey.

The community is comprised of multilingual persons; therefore, some questionnaires were translated into their vernacular language such as Oshiwambo. Apart from that, the researcher learned that Otweya informal settlement dwellers settled according to their ethnic groups (for instance Ovahimba at one area and Otjiherero at their area), therefore, that gave a researcher a definite picture on how the distribution of questionnaires would be carried out. As such, residents were more curious on the new developments of Otweya informal settlements due to the poor living conditions they are facing daily, therefore, the researcher got a clear indication on making sure that the participants understand the reasons for eliciting information from them, which is for studying purpose only.

3.10 Data collection methods

Qualitative data: An interview guide for qualitative data collection was developed to conduct in-depth interviews with ten (10) health care workers (five females and five males) who worked with the HEV patients and ten (10) patients (five males and five females) who suffered/ suffering from HEV in Walvis Bay. The names of the HEV sufferers were taken from the HEV line list that is captured in the Walvis Bay Health Information System office. Due to the COVID-19 regulations on the gathering of people, several not more than ten (10) key informants were interviewed at a time.

During the in-depth- interviews, the researcher tried to avoid or minimize anything that will cause physical or emotional harm to participants by respecting participants and their cultures. The researcher remained neutral and unbiased by not letting personal pre-conceptions or

opinions interfere with the data collection process. Informed consent and anonymity were obtained, and confidentiality of the participants views, and opinions was maintained and ensured. All participants were informed and agreed to be recorded and the audios were stored safely in a device with a password.

Quantitative data: At least two hundred and sixty-four (264) self-administered close-ended questionnaires were administered using a convenience sampling method to the households of Otweya informal settlement dwellers that have been living in the area for more than six months and above the age of 18. This was done to obtain data on cultural issues that act as factors contributing to HEV. Self-administered questionnaires which consisted of nineteen (19) questions were given out amongst households once informed consent had been obtained. Records were reviewed on the number of new cases from the Ministry of Health and Social Services' Health Information System office (HIS) at the Walvis Bay State Hospital.

3.11 Data management and analysis

3.11.1 Qualitative data analysis

Correspondingly, to a study of Lawrence and Tar (2013), the qualitative data gathered from the interview guides of the twenty health care workers who worked with HEV patients and ten HEV sufferers on the main issues, concepts, and categories was organized, studied and initial codes were created. The narrative results were transcribed verbatim, exported into ATLAS.ti,9 software and analysed by generating codes and quotes. Similarly, to the study conducted by Kowal and O'Connel (2014) the data was transcribed verbatim through repeated careful listening. Transcription was performed under the supervision of the researcher immediately after the individual interviews had been completed to maintain the validity of the discussions.

Transcripts were reviewed to ensure data and translation quality. The translated transcripts underwent another round of consistency checks by the researcher to maintain high data quality. The codes were revised, combined and the derived themes were summarized and illustrated with quotes in a cohesive manner considering the purpose of the study. The quotes were illustrated from participants 1 to 10. Some interviews that were in other languages were translated into English for the generation of codes with ATLAS.ti 9 software.

3.11.2 Quantitative data analysis

All quantitative data collected was recorded and analysed using Microsoft Excel of 2016 and Statistical Package for Services Solutions (SPSS) version 26, then checked and cleaned. Associations between dependent and independent variables were determined using a chi-square test as well as the Analysis of Variance (ANOVA) in multiple variables. The level of significance was taken to be 0.05 and the p-value of 3.841 in the Chi-square test and 5.29 in ANOVA analysis. Independent and dependent variables were presented in tables format and interpreted.

3.11.3 Data confidentiality

A unique identifier was allocated to each enrolled participant that facilitated tracking, reporting of results, and data checking. No participant names were included in the analytic data set. This was mainly to protect the confidentiality of both patient data and participants. Data was stored securely and access to electronic data was only possible through password protection that was limited to authorized study staff only.

3.11.4 Data validation

Data cross-checking was done through double data entry and comparing participant records from data collection tools with electronic HEV registers to ensure data quality.

3.11.5 Data security

Questionnaires were kept in a secure place and electronic data was secured by a password. The existing NUST and MoHSS standard procedures were followed for archiving electronic and paper data.

3.11.6 Confidentiality

The study team signed an informed consent form and confidentiality declaration at the beginning of the study to ensure participant information confidentiality (Annexure A and B).

3.12 Inclusion and exclusion criteria

3.12.1 Inclusion criteria

The study only focused on interviewing participants who lived in Walvis Bay informal settlement (Otweya formally known as Twaloloka) for six months and more, those older than 18 years, health care workers, and HEV sufferers. Moreover, only HEV files were reviewed at Walvis Bay State Hospital. The participants that met the criteria and gave their voluntary verbal consent to the researcher were included in the study.

3.12.2 Exclusion criteria

The study excluded all people who lived in Walvis Bay informal settlement for less than six months and those below 18 years of age.

3.13 Ethical considerations

Permission to conduct the study was granted from the Namibia University of Science and Technology (NUST) Higher Degree Committee and the Ministry of Health and Social Services (MOHSS) ethics Committee, see annexure G. Participation in the study was voluntary with the option of participants withdrawing from the study at any point and time they wished. Informed consent was obtained from the willing participants by signing a consent form (Annexure A and B) and they remained anonymous, and information collected was treated confidential. The background of the study was explained to the participants in the languages they understand, and all participants had the right to withdraw anytime from the study or access the data collected.

Furthermore, all data and information gathered from the study were kept confidential and secure (with password protected) in a private computer/recording tape as per the Draft Data Protection Policy of Namibia of 2019. The findings of the researcher were disseminated upon approval from the Namibian University of Science and Technology and the Ministry of Health and Social Services only. Information and data gathered was used for study purposes only.

3.14 Limitations

The study had the following limitations:

- Although some participants were not willing to participate in the study, the benefits of the study on the community were explained to them. Apart from that, the participants were given enough time, preferably on weekends to answer the questionnaires.
- The questionnaire was in an official language; however, the community speaks different languages therefore it was translated in different vernaculars.
- A number of 288 close ended questionnaires were administered, however, only 264 were analysed, twenty questionnaires were treated as incomplete.

3.15 Chapter summary

This chapter covered the research methodology followed in this study. It highlighted the research paradigm, approach and design followed in the study. It also described the research setting, population and sample selected. Furthermore, this chapter provided insight into the research instrument used, the data collection method, the data analysis, and the data management.

Finally, the ethical considerations related to this study and the limitations of the study were explained and described. The following Chapter presents the result finding of the study as per set research objectives.

Chapter 4: Results

4.1 Introduction

This chapter presents both qualitative and quantitative research results and findings. Furthermore, the chapter contained narrative and descriptive results for objective 1 which was to determine the complex predictors to the Hepatitis E virus outbreak among residents in Walvis Bay and objective 3 which was to identify the obstacles to health care for the management of HEV in the Walvis Bay community. The quantitative findings were derived from objectives 2, namely: to establish the association that exists between identified cultural beliefs, socio-demographic characteristics, and HEV. These results and findings were critically analysed and discussed which guided the process of concept analysis and identification of the predictors of HEV in Walvis Bay. Since the study was based on the mixed method and approaches, qualitative findings were reported first, followed by the quantitative statistical results. Descriptive statistics were prepared using frequency tables, pie charts, bar diagrams, and Chi-square and ANOVA presentation for the accurate and clear presentation of data that can be easily understood.

4.2 Results and findings of the study

The participants as key informants in the study were health care workers (10) from all clinics and the State Hospital of Walvis Bay and HEV sufferers (10). Apart from that, at least 264 households living in Otweya informal settlements for more than six months were administered with questionnaires. All participants were from 18 years of age upward. Records from the Health Information System (HIS) on HEV were reviewed.

Section A shows the results and findings from the interview guide. Section B is the reviewed findings and results analysed from the HIS record. Then lastly, Section C is the results and findings from the questionnaire of this study.

4.2.1 Section A: Presentation of in-depth interviews results and findings

The qualitative results about the HEV sufferers and *health workers (who worked with HEV patients) perception on the main predictors of HEV in Walvis Bay*. Qualitative data were collected through in-depth interviews with key informants. The narrative results were transcribed verbatim, exported into ATLAS.ti, software and analysed by generating code and

quotes. Direct quotes from the different respondents are presented in italics in this chapter and chapter 5. All detailed responses are presented in quotes in annexure F.

This section explains, describes, and presents the main research results and findings emanating from the narrative results for objective 1 and 3. The results and findings in this section determine the complex ethnographic issues that act as predictors of the Hepatitis E virus outbreak among residents in Walvis Bay and further identify the obstacles to health care for the management of HEV in the Walvis Bay community.

Table 1 shows a summary of the respondents' views from the interviews held with health care workers and HEV sufferers. A total of 20 responses contributed to the generation of the codes, and its descriptions.

Table 1: A summary of the respondents' views.

| Codes | Descriptions | No of Respondents |
|-------|----------------------------------------------|-------------------|
| 1 | Cultural practices | 18 |
| 2 | Socio-demographic | 10 |
| 3 | obstacles to health care management of HEV | 20 |
| 4 | Interventions from MoHSS and Local Authority | 8 |

Codes from data analysis (Nghihangwa 2021).

Code 1: Main cultural practices of the community

Different cultural practices such as use of traditional medicines, massages and eating sugar and staying under the sunlight were some of the respondent's answers. Some respondents shared their sentiments, as such, the health care workers who worked with patients responded as follows:

"Damara Nama patients drink herbs such as Oukoreb, Kamaku! Nara! nomab, ginger, and garlic when they develop yellow eyes as they believe that it detoxes the body and cures HEV"

"Some patients go for traditional massages especially if they experience epigastric pain due to the HEV infection"

"Aawambo people believe in eating sugar or red jam or drinking urine and staying in the sun when they start to develop HEV signs and symptoms"

Some of the HEV sufferers indicated as follows:

“When I got yellow eyes, I started eating sugar as I was told by my grandmother. I only went to the hospital when body pains initiate “

“When I start getting sick I went to the hospital and got admitted but later I went to seek help from traditional healers”

“We wash our hands in one bucket before we start to eat and during bereavement ceremonies and eat all of us at one plate”.

Code 2: Socio-demographic effects on HEV treatment

The study explored socio-demographics of the community such as age, gender, ethnicity and the socio-economic status. Some of the following responses showed how different socio-demographics of an informal settlement community had an impact on the treatment of HEV patients as bellow:

"More young pregnant ladies tend to seek medical attention compared to men".

“ladies stay in the hospital until discharged by the Doctor compared to man”.

"Self-employed and casuals (employed on fixed-term) patients are less likely to finish the hospitalization period as they do not have income flow, therefore income flow determines how long a patient is willing to stay in the hospital until they fully recover".

Code 3: Obstacles to health care management of HEV cases

The researcher identified different factors that act as obstacles to the health care management of HEV, both health care workers and the HEV sufferers and the health care workers responded as indicated below:

“It is difficult to house patients until they recover due to limited space in health facilities and this encourages patients to seek cultural preferences”

“There is no specific treatment for HEV, and this is making it difficult to treat patients “

“Laboratories take long to test for HEV, and this delays the treatment process”.

"It is difficult to treat patients with co-morbidities as a lot of medicine used to treat HEV symptoms are contra-indicated and this requires the second level and this delays the treatment process".

“It becomes difficult to treat HEV patients as there is always a shortage of medicine”.

“HEV patients do not get health care until the end as they are not monitored and they introduce cultural practices as treatments “

“The HEV Treatment requires patience and only if health education is perceived and given properly “.

The HEV sufferers responded with the following:

“I have never received health education

“The toilets provided are dirty and the Municipality takes time to empty and clean them”

“We wash our hands in the same bucket and use the same hand towel to dry our hands. This experience showed me how our practices put us at risk.”

“I tried to take some herbs to help with the stomach discomfort I had but it did not help at all. My eyes and hands and feet just got more and more yellow”

“It is difficult to survive here in Walvis Bay when you are sick especially when you are unemployed like me. I struggled a lot in terms of finances”

“I am unemployed and sometimes do not have tax fair to go to the clinic “

Code 4: Interventions impacts

The healthcare workers' views on the impacts contributed by the feasible interventions were deliberated on. The majority of the respondents agreed that interventions such as provision of portable water and toilets, hand washing facilities such tippy taps and ANOSAN hand sanitizer and health education have contributed positively to the prevention of HEV outbreak. Some of the respondents narrated as follows:

“Interventions by the Ministry of Health and Social Services, Local Authority and Non-Governmental Organisations have impacted the community positively as there is a bigger change as there are hand hygiene opportunities everywhere (tippy taps)”

"There is a decline in HEV cases "

“The Local Authority provided mobile toilet and portable water points “

"Having working toilets and running water will help the community positively as the accessibility of water will help so many of them not to wash hands in the same water."

"ANOSAN was made readily available to the community, but the community is not accepting it until the COVID-19 pandemic hit us in 2020"

Although most of the health care workers indicated that, the MoHSS and Local Authority such the Walvis Bay Municipality had some positive interventions on combatting of HEV outbreak, some HEV sufferers had different opinion as quoted below:

“I have never received health education nor ANOSAN hand sanitizers “

“We do not use the toilets provided at night because it is not safe “

“The toilets provided are dirty”

4.2.2 Section B: Health Information System (HIS) results and findings

This section shows the distribution of HEV Lab confirmed cases as of 28 June 2018 to April 2021. The section also presents the socio-demographic characteristics of HEV sufferers in Walvis Bay. The data was drawn from the HIS records of the Walvis Bay State Hospital, which was reviewed, analysed and represented into quantitative graphs, as depicted in figure 1, 2, 3 and 4.

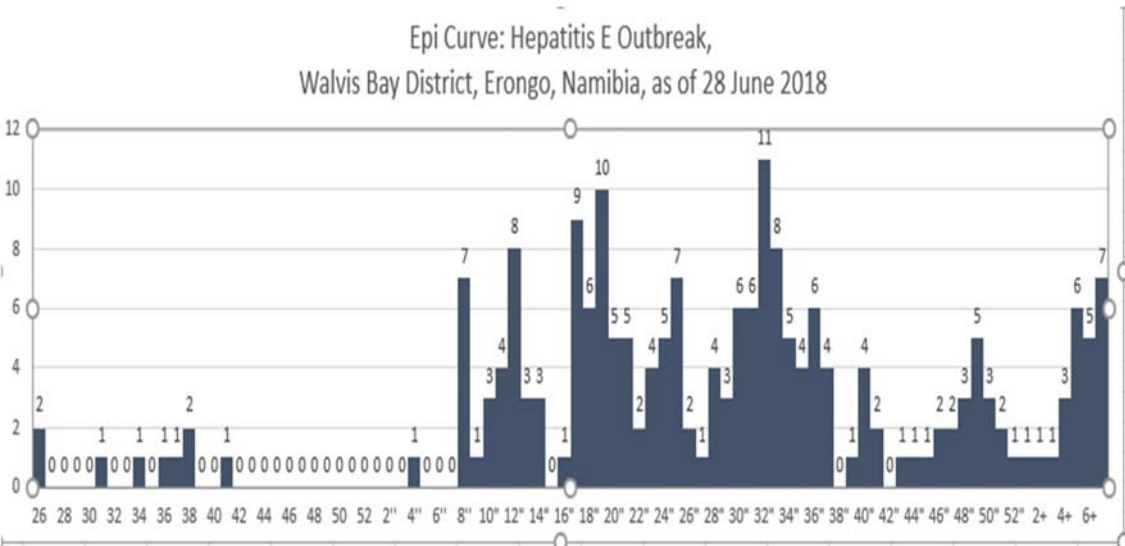


Figure 2: Epidemiological curve of HEV cases from 28 June 2018-April 2021, Walvis Bay, Erongo region.

Figure 1 depicts that a total number of two cases were initially recorded on week 26, the highest cases (11) were recorded in week 32. A number of different cases and its figures are further depicted on figure 1 in different weeks.

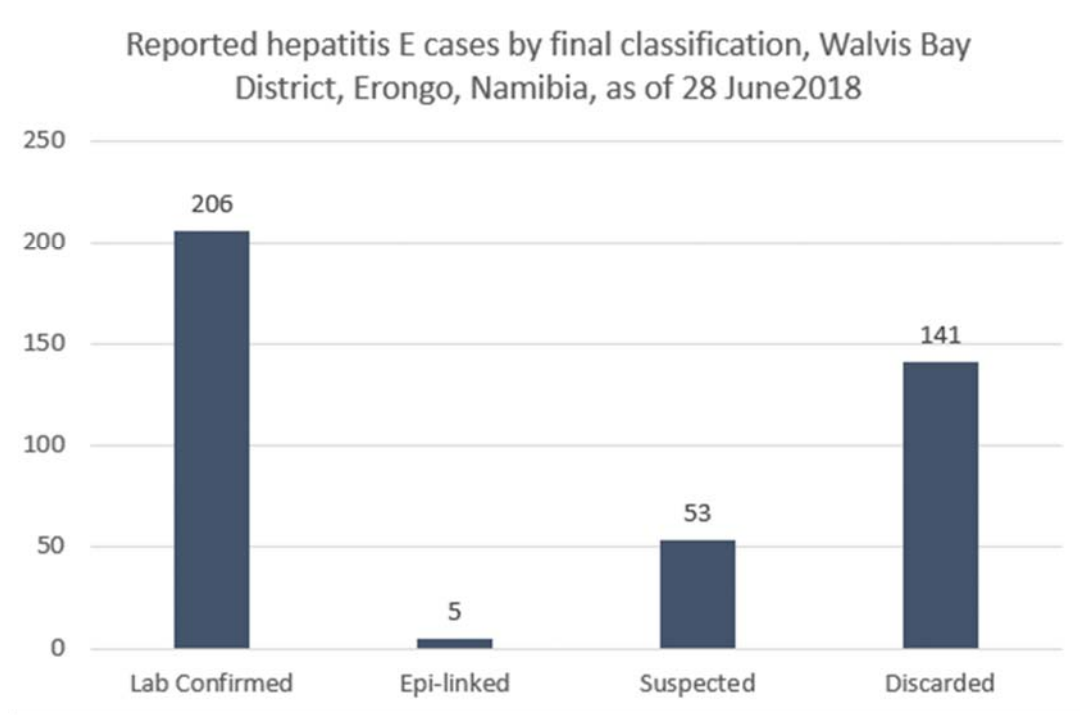


Figure 3: Classification of cases as reported in Walvis Bay.

The records in figure 2 shows that out of 405 cases recorded in Walvis Bay, 206 were lab-confirmed, 141 were discarded. The figure further depicts that at least 53 HEV cases were suspected while only 5 cases were epidemiological linked.

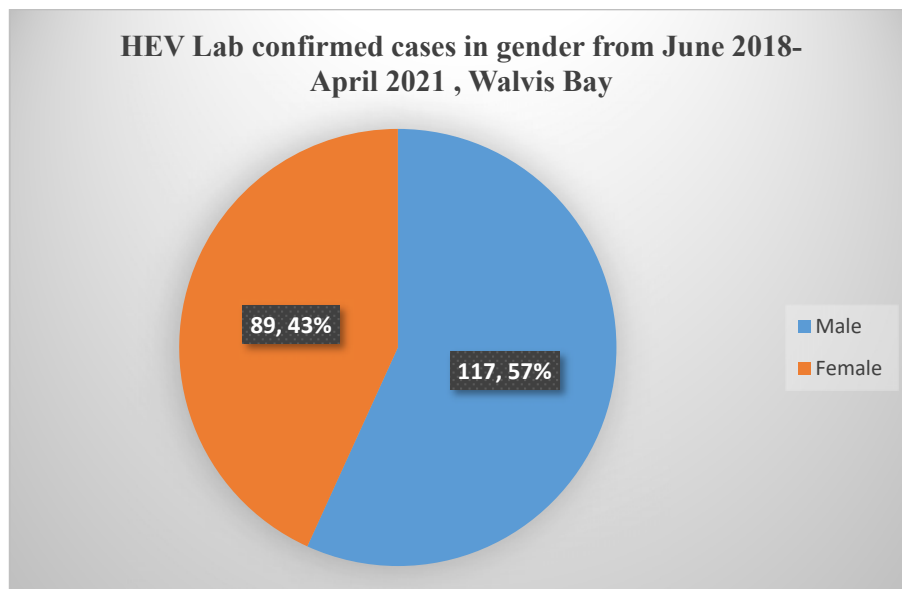


Figure 4: HEV Lab confirmed cases

In terms of gender representation, figure 3 depicts that the majority (57%) of cases infected by HEV are male compared to females (43%).

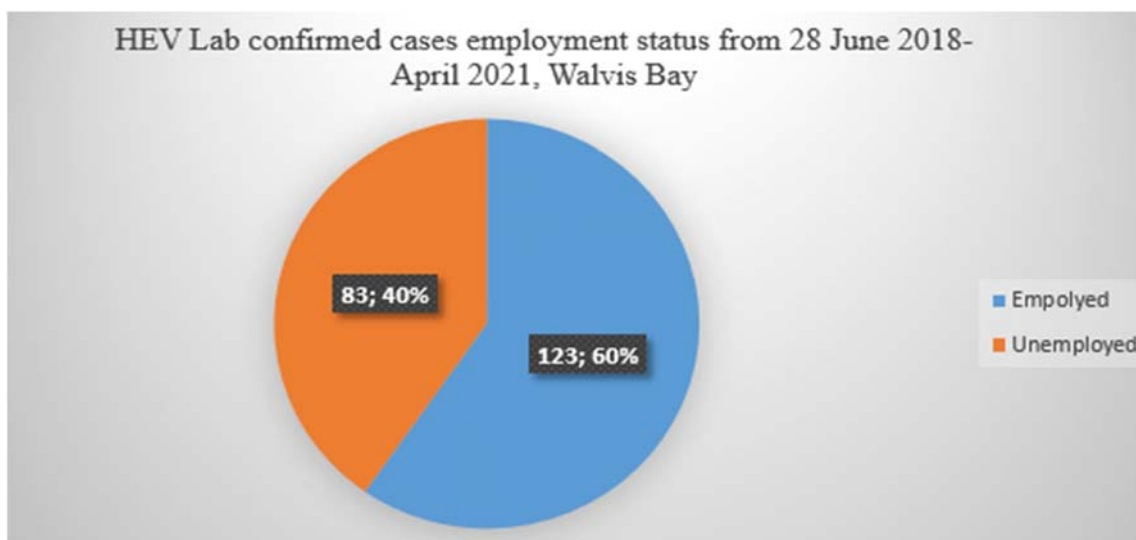


Figure 5: Employment status of the laboratory confirmed HEV cases.

The employment status of the HEV cases victims is presented in figure 4. The figure shows that the majority (60%) of the lab-confirmed cases of HEV in Walvis Bay are employed compared to the unemployed (40%), as seen on figure 4.

4.2.3 Section C: Questionnaires results and findings

This section presents the research results and findings based on the data collected from the respondents of Otweya informal settlement using the questionnaires. This section presented the association between the socio-demographic factors such as gender, employment status, ethnicity, educational level, and the identified ethnographic issues. The results and findings are presented in Tables 2, 3, 4, 5, 6, 7 and 8, including those depicted in figures 5, 6 and 7.

Table 2: A summary of the questionnaires of respondents.

| Respondents | Questionnaires distributed | Questionnaires returned | Questionnaires used | Response rate |
|-------------|----------------------------|-------------------------|---------------------|---------------|
| 288 | 288 | 264 | 264 | 91% |

Figure 5 below indicates the gender distribution. Whereby, the majority (67%) of the participants in Otweya informal settlement were male, while the remaining were female, as depicted in figure 5.

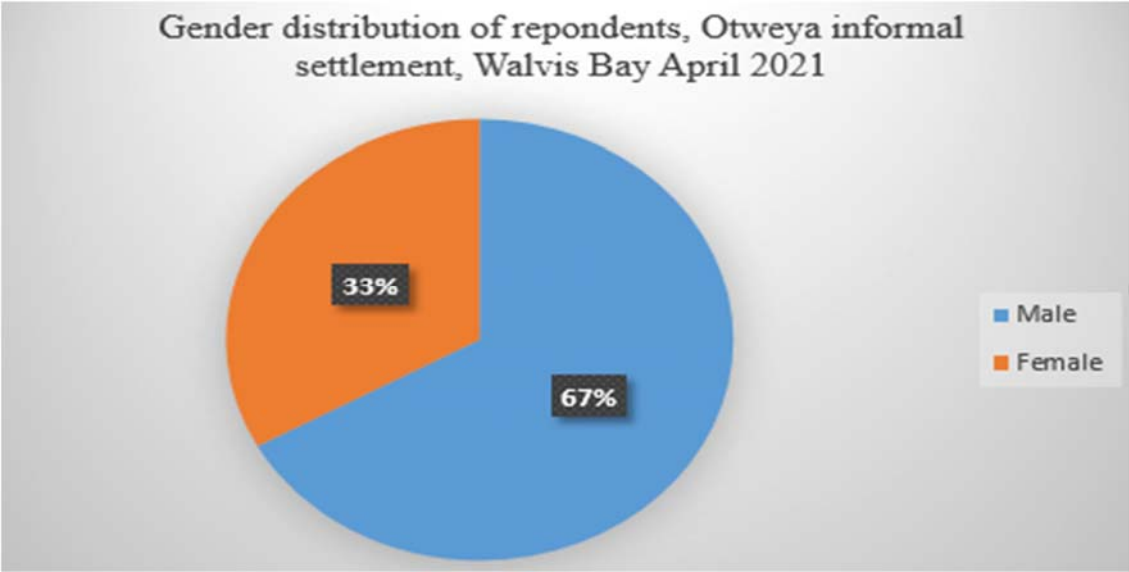


Figure 6: The distribution of the sample population by gender.

Figure 6 illustrates that the percentage (%) response rates from various ethnic groups that participated in the study. The majority (73%) are Aawambo, followed by Ovahimba (10%), Ovaherero, and Damara Nama were represented by 7% and the least were Kavango (3%).

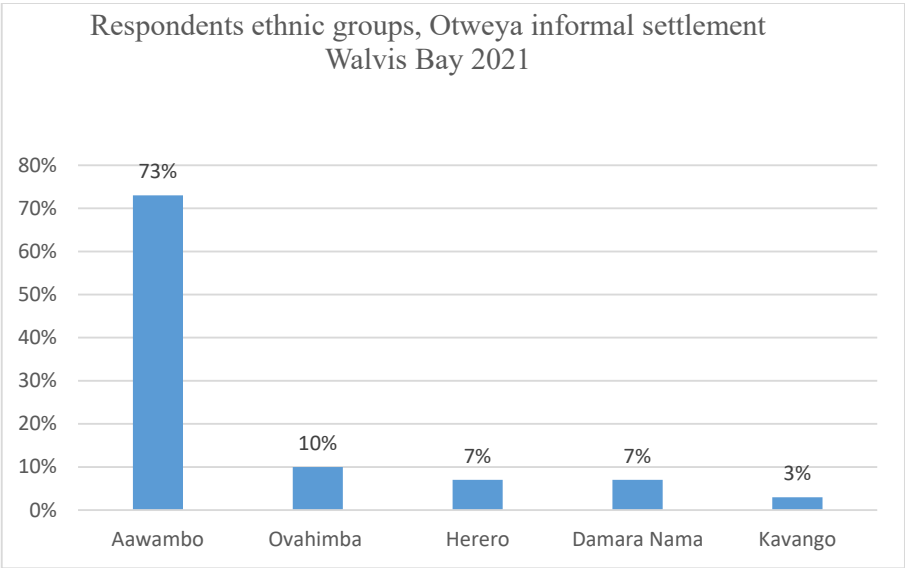


Figure 7: Different ethnic groups of the respondents.

The majority (94%) of the respondents indicated that eating with hands (no cutlery), as seen on Table 3 and 4, and was recorded as the mostly cultural practice believed by many. This is followed by 73% of respondents believing in eating together in one plate, washing hands in one bucket were shown by 67% of the respondents and the second least with 66% was shaking hands when greeting the least 45% of the respondents use traditional medicine before modern medicine, see Table 3.

Table 3: Cultural beliefs identified in Otweya Informal settlement through questionnaires.

| Cultural beliefs identified | Mean | Number of respondents % | Number of respondents (n=264) |
|-----------------------------------------------------------------------------|------|-------------------------|-------------------------------|
| Use of traditional medicine(Oukoreb, Kamaku, !Nara !nomab, ginger , garlic) | 0.45 | 45% | 119 |
| Shaking hands when greeting | 0.66 | 66% | 176 |
| Washing hands in one bucket | 0.67 | 67% | 177 |
| Eating food with hands (without cutlery) | 0.93 | 94% | 248 |
| Eating together at one plate | 0.72 | 73% | 192 |

Figure 7 shows that the null hypothesis is therefore rejected as the chi test calculated at a degree of freedom (1) is more than 3.841 (critical value) thus the alternative hypothesis is accepted. In these results, the Pearson chi-square statistic is 36.037 and the p-value = 3.841. The likelihood chi-square statistic is 36.037, and the p-value = 3.841 (see figure 7). Therefore, at a significance level of 0.05, it is concluded that the association between cultural practices and employment status is statistically significant, see Table 4.

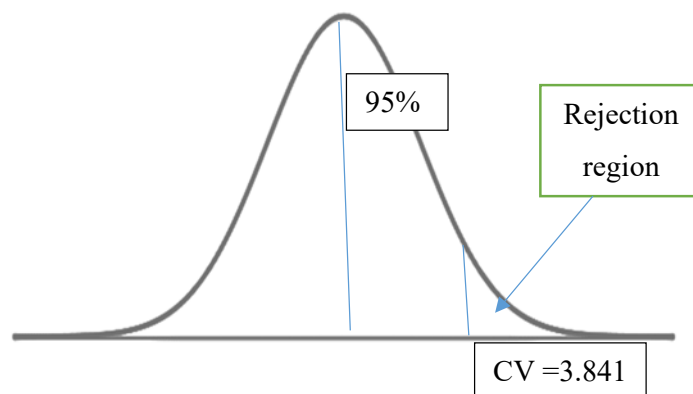


Figure 8: Chi square.

Table 4: The relationship between cultural beliefs and employment status.

| Employment Status | Cultural practices | | Total |
|-------------------|--------------------|-----------|------------|
| | Yes | No | |
| Yes | 23 | 41 | 64 |
| No | 153 | 47 | 200 |
| Total | 176 | 88 | 264 |

H₀ = there is no association between employment and cultural practices leading to the prevalence of HEV.

H_A=There is an association between the employment of respondents and cultural beliefs (see Table 5) that will lead to the prevalence of HEV.

$$X^2 = (O-E)^2/E$$

$$(23-42.7)^2/42.7 + (41-21.3)^2/21.3 + (153-133.3)^2/133.3$$

$$X^2 = 36.037$$

Table 5: The relationship between cultural beliefs and gender.

| Gender | Cultural practice | | Total |
|---------------|-------------------|----|------------|
| | yes | No | |
| Female | 130 | 46 | 176 |
| Male | 66 | 22 | 88 |
| Total | 196 | 68 | 264 |

H₀ = there is no association between the Gender of respondents and cultural practices leading to the prevalence of HEV.

H_A=There is an association between the gender of respondents and cultural beliefs, see Table 5 and 6, that will lead to the prevalence of HEV.

$$X^2 = (O-E)^2/E$$

$$(130-130.7)^2/130.7 + (46-45.3)^2/45.3 + (66-65.3)^2/65.3$$

$$X^2 = 7.531$$

The null hypothesis is therefore rejected as the chi test calculated at a degree of freedom (1) is more than 3.841 (critical value) thus the alternative hypothesis is accepted. In these results, the Pearson chi-square statistic is 7.531 and the p-value = 0.006 The likelihood chi-square

statistic is 36.037, and the p-value = 3.841. Therefore, at a significance level of 0.05, it is concluded that the association between cultural practices and gender is statistically significant, see Table 5.

Table 6: Relationship between cultural beliefs and education.

| Educational level | Cultural belief | | |
|-------------------|-----------------|-----|------------|
| | Yes | No | Total |
| Uneducated | 43 | 5 | 48 |
| Educated | 105 | 111 | 216 |
| Total | 148 | 116 | 264 |

H₀ = there is no association between education and cultural practices leading to the prevalence of HEV.

H_A=There is an association between the education of respondents and cultural beliefs that will lead to the prevalence of HEV.

$$X^2 = (O-E)^2/E$$

$$(43-26.9)^2/26.9 + (5-21.1)^2/21.1 + (105-121.1)^2/121.1$$

$$X^2 = 26.791$$

Table 7: The relationship between cultural beliefs and ethnicity.

| Ethnicity | Cultural Beliefs | | |
|--------------------|------------------|-----------|------------|
| | Yes | No | Total |
| Aawambo | 164 | 31 | 195 |
| Ovaherero | 15 | 4 | 19 |
| Damara Nama | 9 | 7 | 16 |
| Ovahimba | 26 | 0 | 26 |
| Kavango | 5 | 3 | 8 |
| Total | 219 | 45 | 264 |

The null hypothesis is therefore rejected as the chi test calculated at a degree of freedom (1) is more than 3.841 (critical value) thus the alternative hypothesis is accepted. In these results, the Pearson chi-square statistic is 26.791, and the p-value = 3.841. The likelihood chi-square

statistic is 26.791 and the p-value = 3.841. Therefore, at a significance level of 0.05, it is concluded that the association between the cultural practices and the level of education of the respondents is statistically significant, see Table 6.

Table 8: Summary statistics on the ethnic groups.

| SUMMARY | | | | |
|--------------------|--------------|------------|----------------|-----------------|
| <i>Group</i> | <i>Count</i> | <i>Sum</i> | <i>Average</i> | <i>Variance</i> |
| Aawambo | 5 | 641 | 128,2 | 2262,7 |
| Ovaherero | 5 | 50 | 10 | 9,5 |
| Damara Nama | 5 | 64 | 12,8 | 51,2 |
| Kavango | 5 | 39 | 7,8 | 0,2 |
| Ovahimba | 5 | 118 | 23,6 | 18,8 |

H_0 =The null hypothesis is that the group means are all equal.

H_A =The alternative hypothesis is that not all group means are equal

The null hypothesis is rejected because the F critical (2.86) is lower than the F value (28.45) with p-value =5.29 thus not all group means are equal. There is a significant difference between the means of different ethnic groups (Table 7 and 8) with the cultural practices.

4.3 Chapter summary

The chapter demonstrates, explained, and described the study results and findings from the data obtained and collected from both qualitative and quantitative research methods used in the study. The results and findings are presented in graphs, quotes, and Tables and further interpreted to respond to the set research objectives and research questions of this study, with literature support from other international authors on the subject matter. The research results and findings were presented as they were collected sequentially, interview guide first, the HIS record review and finally research questionnaires.

The following chapter, Chapter 5, illustrates the result discussion and conclusion of the study.

Chapter 5: Discussion of Results

5.1 Introduction

This chapter presents a detailed discussion of the major research results and findings, also concerning the literature reviewed, the study objectives, and the conceptual framework. The purpose of this study was to determine cultural beliefs towards predictors of Hepatitis E virus and its preventative strategies among the Walvis Bay residents. The study determined an association between cultural beliefs identified and the socio-demographic features of Otweya informal settlement dwellers. Lastly, the study explored the effect of cultural beliefs and socio-demographic features on the health care management of HEV in general.

5.2 The main predictors of the Hepatitis E Virus outbreak identified in the Walvis Bay community

This study identified cultural issues in the Otweya informal settlement of Walvis Bay. The total (45 %) of this community believed in the use of traditional medicine such as Oukoreb, Kamaku! Nara-! nomab, ginger, and garlic than modern. This was as well indicated by health care workers that:

“specific patients drink herbs when they develop yellow eyes as they believe that it detoxes the body and cure HEV”.

“Aawambo people believe in eating sugar or red jam or drinking urine when they start to develop HEV signs and symptoms “.

A study was done by Burniston, Okello, Khamlome Inthavon, Gilbert, Blacksell, Welburn (2015) on the cultural drivers and health-seeking behaviours. The same study concluded that people believed that traditional medicine offers the possibility of cure where modern medicine cannot. Further, more HEV sufferers also indicated as:

“when I got yellow eyes, I started eating sugar as I was told by my grandmother. I only went to the hospital when body pains initiate “

Taoism (a tribe in Asian Americans) believes that perfection is achieved when events are allowed to take the more natural course and intervention is therefore frowned upon (Gruzinski, 2014). This was similarly indicated by the HEV sufferers as follows:

“When I start getting sick I went to the hospital and got admitted but later I went to seek help from traditional healers”.

Another identified cultural belief was on hand practices. This study showed that shaking hands when greeting was common with 66% participants, eating together at one plate as the most common with 73%, eating with hands (without cutlery) with the highly common practice with 94%, and washing hands in one bucket with 67%. Some study results indicated that hands may be a sufficient cause of infection transmission especially in situations where sanitation is inadequate. Notwithstanding, faeces are a key vehicle for the transmission of pathogens to hands and surfaces (Bloomfield, Exner, Signorelli, Nath and Scott, 2012). In addition, a study by Teshale, Grytdal and Howard, showed a positive analysis of which households with more than two cases of hepatitis were more likely to have a member who attended a funeral and has shaken hands or washed hands in a common basin with others thus, washing hands in a common basin with others was significantly associated with HEV infections (2010). In this study, HEV sufferers indicated as follows:

“We wash our hands in one bucket before we start to eat and during bereavement ceremonies and eat all of us at one plate”.

“Before COVID-19 we used to greet each other by shaking our hands”.

A similar study by Howard *et al.*, on the risk factors associated with HEV, showed a positive response (Adjusted Odds Ratio = 1.9; 95% CI = 1.07–3.38) with this study whereby communal handwashing in a common basin with others was significantly associated with acute hepatitis E virus in the case-control analysis. This practice was relatively common in Paloga, especially during funeral services when large numbers of relatives and friends congregated (2010).

5.3 An association between the cultural beliefs and socio-demographic characteristics that would cause HEV

a) Gender

The majority of the respondents in this study were male (67%) compared to females (33%). It was as well indicated in the record review of the confirmed cases in Walvis Bay that the majority of the HEV cases were male (57%) than females (43%). Bustamante *et al.* (2020) study on the nationwide Hepatitis E Virus outbreak in Namibia, found out that the majority (72%) of the patients were males compared to females, and the majority of cases (59%) occurred in males. This study showed that there is an association between the identified cultural beliefs and gender. In a study by Kanter, & Caballero (2012) on the global gender

disparities in obesity showed that sociocultural factors related to dietary habits appear to have a greater influence on gender disparities in overweight and obesity. Furthermore, during the interview guide, the health care workers specified that:

*"ladies stay in the hospital until discharged by the Doctor compared to men", and
"more young pregnant ladies tend to seek medical attention compared to men".*

A positive association of cultural beliefs and gender was determined in this study (p value=3.841). Hepatitis E virus are generally caused by genotype 3 which commonly affects older persons (median age 50 years) and predominantly male persons (Nelson, Kmush and Labrique, 2011). Therefore, the positive association of cultural beliefs and gender which was determined, one could say that is attributed to the fact that women tend to stay in hospital until they recover, unlike men. It could also be ascribed to those women seek medical care on time, particularly when they are pregnant, and they are being diagnosed and treated on time.

b) Education

The respondents were asked to indicate their education status, whereby the majority (81.8%) are educated and 18.1% are uneducated. Furthermore, an association between education and identified cultural beliefs was determined (p value=3.841). Education develops the learned effectiveness that enables self-direction toward any and all values sought, including health despite cultural forces, (Bruner 2020). Education has a major role to play in an individual's life by helping an individual to understand the world and the environment to live life adequately and makes the individual aware of different values, norms, customs, and traditions which are essential for his existence and development (Gharabaghi, 2011). The results show a positive association in a similar study on the prevalence and risk factors of HEV by Farshadpour, Taherkhani, Ravanbod, Eghbali, Taherkhani, and Mahdavi (2018), it showed that pregnant women with a higher education level had a lower seroprevalence of anti-HEV total antibodies (1.17%) and anti-HEV IgM (0.0%) when compared to uneducated women (46.51% and 11.63%, respectively). The study by Li *et al.* (2020) on the global HEV infections indicated, as well a positive association of education and HEV infection (P value= $< .0001$) in respondents who received an education than elementary school. In another study by Sobhan (2014) proves that educational achievement is associated with the attainment of financial security and health insurance. Sobhan maintains that the majority of Taiwanese, Japanese, Filipino, and Korean Americans who obtained a high school education or higher got correspondingly higher rates of health insurance coverage compared to those from Southeast

Asia (Hmong, Cambodians, Laotians, and Vietnamese) with half-completed high school education (2014).

c) Employment

The employment status of the respondents was explored and the association to the cultural beliefs was determined. According to the health care workers, they indicated as:

"Self-employed and casuals (employed on fixed-term) patients are less likely to finish the hospitalization period as they do not have income flow, therefore income flow determine how long a patient is willing to stay in the hospital until they fully recover".

It was as well indicated by the HEV sufferers as:

"I am unemployed and sometimes do not have tax fair to go to the clinic"

A positive association of employment to cultural beliefs was determined (P-value =3.841). Clough, Lee and Chae (2013) study on the barriers to health care among Asian immigrants in the United States indicated that socio-economic status has a large impact on the health care of patients in general, and Asian patients were not an exception (14% of US Asian families live below the poverty line compared with 11.5% of Caucasian families). In the same study, Clough, Lee, and Chae indicated that impoverished Asian immigrants had low-income jobs with long working hours and no health benefits. Consequently, they often do not seek medical care, especially for disease prevention unless they have symptoms. Furthermore, these patients are usually reluctant to seek medical attention even when they have symptoms, because of potential loss of work time and inability to pay doctors' fees (2013). The study results of Realpe-Quintero and others confirmed that due to the low-income status that prevails in most of the developing countries HEV infections prevalence can be promoted by socio-economic factors (Realpe-Quintero *et al.*, 2018). In another study by Nguyen (2012) on the effects of socio-cultural factors on older Asian Americans' access to care, indicated that the employment options of Asian Americans were less likely to include health insurance benefits (obtaining affordable health insurance coverage) and that prevents people to seek medical attention and increase the Hepatitis B infections.

d) Ethnicity

The respondents were asked to indicate their ethnic group was by the majority (73%) of them represented Aawambo tribe, Ovahimba (10%), Ovaherero and Damara Nama (7%), and the

least Kavango (3%). Ethnicity, culture, and religion play important roles in influencing health-seeking behaviours (Burniston *et al.*, 2015). There are evidence that racial and ethnic minorities tend to receive a lower quality of health care than non-minorities and that patients of minority ethnicity experience greater morbidity and mortality from various chronic diseases than others (Egede *et al.*, 2011).

This study determines a positive relationship between ethnicity and cultural beliefs (p-value 5,29). The study by Farshadpour *et al.*, conducted in Iran, showed that according to ethnicity, Afghan women had the highest seropositivity (68.0% for anti-HEV total antibodies and 16.0% for anti-HEV IgM antibodies), while Arabic women showed the lowest seroprevalence rates (3.16% for anti-HEV total antibodies and 0.0% for anti-HEV IgM). Overall, the highest rate of HEV seroprevalence was observed among the Afghan ethnic group (2018).

A study by Artinyan *et al.* (2010) showed a positive relationship between ethnicity and metastatic disease as it was lowest in black patients with the worst survival compared with every other ethnicity in all subgroups (all P values <.001) thus, black race was associated with significantly poorer survival in comparison with all other ethnicities (P < .001), on the contrary, Verna *et al.* (2012) study showed that ethnicity was not statistically significant (P =0.85).

5.4 The obstacles to health care management of HEV in the Walvis Bay community

In the study by Dilworth-Anderson, Pierre, and Hilliard (2012), it was stated that many structural barriers to health care may equally impact people of low socio-economic status, regardless of cultural beliefs. Therefore, when socio-cultural differences between patient and health care providers are not fully accepted, appreciated, explored, or understood, patients may have very different socio-cultural based health beliefs, medical practices, including the use of home remedies, attitudes toward medical care, and the levels of trust in doctors and the health care system (Andrulis, 2013).

5.4.1 Use of traditional medicine

According to the World Health Organization (2013), traditional medicine refers to health practices, approaches, knowledge, and beliefs incorporating plant, animal, and mineral based medicines, spiritual therapies, manual techniques, and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being. The study by

Aragaw, Afework and Getahun, (2020) on the assessment of the knowledge, attitude, and utilization of traditional medicine among the communities of Debre Tabor Town, Amhara Regional State, North Central Ethiopia found out that 36.1% of respondents prefer the use of traditional medicine (*Ruta chalepensis* and *Hagenia abyssinica*) than modern medicine. Yuan *et al.* in their study, stated that the use of natural products as medicines has presented a tremendous challenge to early humans. It is highly probable that when seeking food, early humans often consumed poisonous plants, which led to vomiting, diarrhea, coma, or other toxic reactions or perhaps even death (2016).

Similarly, an increase in reported cases of chronic diseases especially in developed countries has been attributed to the growing use of traditional medicine (Ekor, 2014). Although modern treatments are widely available to deal with these ailments, some patients are convinced that modern medicines have not provided satisfactory results, hence, the use of traditional medicine is considered (Abdullahi, 2011).

Contrary to a study by Ekor (2014) on the adverse health effect of the usage of traditional medicine, Gong *et al.*, found out that a traditional medicine used to treat HEV in China had no adverse effect. After the administration of *Babao Dan* (the traditional medicine of Chinese) on the HEV infection, it was found out to be effective in protecting liver tissue from damage by HEV infection and had a potential effect on inhibiting HEV replication, (2018). Through in-depth-key interview questions of this study, the health care providers specified as:

“It is difficult to house patients until they recover due to limited space in health facilities, and this encourages patients to seek cultural preferences”

The health care providers in this study postulated that the lack of medicine for HEV treatment is an obstacle to the management of HEV as follows:

“There is no specific treatment for HEV, and this is making it difficult to treat patients “.

There is an HEV vaccine that is only licensed and available in the private market in China, and it is yet to be prequalified by the WHO for use in endemic settings and outbreaks (Horvatits *et al.*, 2019). This is supported by the study by Gong *et al.* (2018) which showed that *ribavirin* treatment was more effective in rapidly clearing HEV infection, but anti-HEV antibodies were not detected in 50% of ribavirin-treated animals until the end of the study period, this suggests that ribavirin can influence the immune response against HEV infection.

Furthermore, the study indicated as follows:

"it is difficult to treat patients with co-morbidities as a lot of medicine used to treat HEV symptoms are contra-indicated and this requires the second level and this delays the treatment process".

"It becomes difficult to treat HEV patients as there is always a shortage of medicine". "There is no specific treatment for HEV, and this is making it difficult to treat patients ".

Inadequate accessibility to modern medicines and drugs to treat and manage diseases in middle and low-income countries, especially in Africa, may have contributed to the widespread use of traditional medicine especially in poor households (Abdullahi, 2011).

5.4.2 Socio-demographic features

Socio-economic status is one of the most important factors associated with medical outcomes thus when socio-economic status is low, medical care is inadequate and this has been attributed to adverse outcomes (Kim et al., 2018). This study found out from the HEV sufferers as follows:

"I am unemployed and sometimes do not have tax fair to go to the clinic ".

This is supported by the study by Fokunang *et al.* (2011) that showed that respondents were discouraged to access health care facilities due to transport fares as well as the high cost of medicine. Furthermore, the majority of subjects believed that their access to health care was worse as a result of their socio-economic status. Many described the situations in which they were delayed or avoided seeking health care because of cost, which typically resulted in worsening of their conditions (Arpey, Gaglioti and Rosenbaum, 2017). In another study by Becker and Newsom (2013) indicated that low-income respondents reported higher levels of dissatisfaction with health care than middle-income respondents and opposing differences were found in responses relative to respondent age.

Price *et al.*, in their study specified that another barrier to health care access is the proximity of the service or the provider to the patient. These barriers are often detrimental in the process of seeking appropriate health care among ethnic minorities. Many socio-economically disadvantaged groups have low health literacy, and this means that they are unaware of the opportunities available to them and how to access them (2013).

5.4.3 Interventions

During the in-depth key interviews on the impact of interventions introduced in the community of Otweya informal settlement, the health care providers indicated as:

“Interventions by the Ministry of Health and Social Services, Local Authority and Non-Governmental Organisations have impacted the community positively as there is a bigger change as there are hand hygiene opportunities everywhere (tippy taps) and there is a decline in HEV cases”

A study by Kirkwood, Dobscha, and Steele specified that a current outbreak in Namibia has lasted over 2 years to date because of the problems such as persistent contamination in an underground aquifer that is a primary source of water, displaced populations that are likely to experience diminished access to appropriate health care, overcrowding and unsanitary conditions that are ideal environments for the spread of waterborne diseases like hepatitis E virus (2020).

Vulnerable subpopulations are frequently affected due to poor living conditions in urban slums where water and sanitation services and health infrastructure are poor (Azman *et al.*, 2019). Kirkwood, Dobscha, and Steele (2020) indicated that many endemic areas lack clinical awareness and lab testing capabilities, which present significant barriers to diagnosis, and often the only documented cases are those severe enough to require hospitalization. The following was as well indicated by both HEV sufferers and the health care workers in this study:

“I have never received health education nor hand sanitizers.”
"The HEV Treatment requires patience and only if health education is perceived and given properly"
“Laboratories take long to test for HEV, and this delays the treatment process”

With the absence of any available intervention or effective treatment, educational efforts often primarily drive patients into hospital settings where they receive reactive and limited management (Kirkwood, Dobscha, and Steele, 2020).

5.6 Chapter summary

This chapter presented the discussion of the research result and findings, objectively. The results and findings of the study showed that the community of Otweya informal settlement has cultural practices such as the use of traditional medicine to treat HEV, shaking hands when greeting, washings hands in one bucket, eating with own hands, and eating together at one plate. Apart from that, a positive association between socio-demographic factors (gender, employment status, ethnicity, and education) was identified.

The chapter also provided details that this study identified factors such as the use of traditional medicine, socio-demographic factors, and lack of or ineffective interventional methods as factors that hinder the health care management of HEV cases. The following chapter, chapter 6, presents the conclusions and recommendations at different levels of the study.

Chapter 6: Conclusion and Recommendations

6.1 Introduction

In the current chapter, an overall summary of the study will be presented. This chapter displays the conclusion and recommendation of the study objectively to the relevant and responsible groups. It starts with the study conclusion and end with recommendations.

6.2 Summary

- **Objective 1:** Determine the predictors of the Hepatitis E virus outbreak among residents in Walvis Bay.

Otweya informal settlement in Walvis Bay town is made up of various ethnic groups with their different cultural backgrounds and practices they believe in to cure or treat health-related conditions and diseases. HEV is one of the diseases that was detected in 206 patients in Walvis Bay from 28 June 2018 till date, of which the majority are residing in the Otweya informal settlement. The study identified complex cultural practices such as the preferred use of traditional medicines, shaking hands when greeting, eating together at one plate, washing hands in one bucket, and eating with own hands.

- **Objective 2:** Establish the association that exists between identified cultural beliefs, socio-demographic characteristics, and HEV.

Due to the living condition of the residents and ineffective interventional strategies a positive association between the socio-demographic factors (ethnicity, employment, Gender, and education) and the cultural beliefs of the community. These socio-demographic factors could lead to the prevalence of HEV, if observed.

- **Objective 3:** Identify the obstacles to health care for the management of HEV in the Walvis Bay community

Many structural barriers to health care may equally impact people, thus the study identified the preferred use of traditional medicine as one of the obstacles to the health care management of people. Apart from that, like other similar studies, this study acknowledged the lack of HEV medicine, gender, low socio-economic status, cultural beliefs, and ethnicity as reasons why HEV health care is not manageable. Furthermore, different cultural practices were reported and how this affects the health care management of HEV sufferers

6.3 Recommendations

6.3.1 To community members

The following are the recommendation to the community members:

- The community to make use of health care services that are provided for prevention (health education), treatment (medication), and rehabilitation (subsequent follow-up) for HEV.
- To improve on hygienic practices such as washing hands correctly with soap and clean running water.
- Timely seeking of health care services upon onset of symptoms.
- The community to start seeking proper guidance from health care workers on their cultural practices.

6.3.2 To the health care workers

The following are the recommendation to the health care workers:

- To be culture sensitive during the health education. When giving health education to patients it is important to consider their cultural practices as this makes the health education relevant to the patient. Something as common as hand wash is done differently by different cultures, therefore a hand wash demonstration and correct use of soap and clean running water should be emphasized when giving hand hygiene information to the patients.
- Awareness creation on proper health-seeking attitude through health education. This should be clear among the rural populace and supported with the provision of adequate health care services that will meet the needs and demands of the people.
- Health care providers to understand and respect people's cultural practices and be able to give guidance on the probable risks and side effects of the traditional practices without judging patients.
- Health workers to engage the community especially street vendors and emphasize the importance of correct hygienic practices such as hand washing during the preparation of food, proper washing of fruits and vegetables, and preventing too much touching of goods being sold.
- Through community engagement, health care workers empower individuals to take more active responsibility for their health issues.

6.3.3 To the MoHSS (policy level)

The following are the recommendation to the MoHSS:

- Given the increasing diversity of cultural health attributions, beliefs, and practices, the field of medicine must prioritize the importance of cultural attributions, values, beliefs and practices play in the health and healing of HEV patients. Medical education programs need a teaching philosophy to incorporate approaches, interventions, and models which take such factors into account.
- An introduction of action review should be conducted after interventions were implemented in the community to identify the best practices done, the impacts, gaps/areas not covered, and the areas of improvement.
- Integration of primary health care strategies to incorporate cultural practices of the communities to serve communities in informal settlements in Namibia effectively.

6.3.4 For future studies/research

Based on the results of this study, it is crucial to expand this study nationally to get a true reflection of the impacts that cultural practices have on the management of HEV in informal settlements of Namibia.

6.3.5 Walvis Bay Municipality

The municipality to provide sanitary infrastructure as it plays a vital role in provision of safe water supply and sanitation facilities. Water and sanitation are crucial in prevention and control of HEV in the community.

6.4 Conclusion

The aim of conducting the study was to determine cultural beliefs towards predictors of Hepatitis E virus and its preventative strategies among the Walvis Bay residents. Different cultural beliefs were identified and their association with the demographic characteristics of the Otweya community was relatively identified. The researcher of this study posits that the study contributes to the body of scientific knowledge in HEV management in informal areas of Namibia, and thus, more similar studies should be conducted.

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Annexures

| | |
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| Annexure A | Consent form |
| Annexure B | Letter to the participants |
| Annexure C | Close-ended questionnaire |
| Annexure D | Interview guide for HEV sufferers |
| Annexure E | Interview guide for health care workers |
| Annexure F | Interview responses for both Health care workers and HEV sufferers |
| Annexure G | Permission letter from the MoHSS to carry out a study. |
| Annexure H | Turnitin report |
| Annexure I: | Certificate of English Editing and proofreading |

Annexure A: Consent form

Title of the study: An investigation into predictors of hepatitis E virus and its preventative strategies in Walvis Bay, Erongo region Namibia.

Name of Researcher: Justina PL Nghihangwa

Student No: 219038139

Course: Masters in Health Sciences

Institution: Namibia University of Science and Technology (NUST)

Supervisor: Dr. R. Mahalie; **Co –supervisor:** Mr J. George

- I..... voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.

- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.
- I understand that I will not benefit directly from participating in this research.
- I agree to my interview being audio-recorded.
- I understand that all information I provide for this study will be treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous.
- I understand that if I inform the researcher that myself or someone else is at risk of harm
- I understand that under freedom of information legislation I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of research participant

Date

Signature of researcher Date

Date

Annexure B: Letter to the participants

Research Questionnaire to Walvis Bay community living in Otweya informal settlement

Title An investigation into the predictors of hepatitis E virus and its preventative strategies in Walvis Bay, Erongo region, Namibia

Name of Researcher: Justina PL Nghihangwa

Student No: 219038139

Course: Masters in Health Sciences

Institution: Namibia University of Science and Technology (NUST)

Supervisor: Dr. R. Mahalie; **Co –supervisor:** Mr J. George

Dear participants

The aim of this questionnaire is for the researcher to collect enough information on predictors of HEV and its preventative measures.

The objective of this study is to:

- determine predictors of the Hepatitis outbreak among residents in Walvis Bay.
- establish the association that exists between identified cultural beliefs, socio-demographic characteristics and HEV.
- identify the obstacles to health care for management of HEV in the Walvis Bay community
- assess the effectiveness of the existing preventative strategies on HEV outbreak.

Instructions

1. Please mark with an X in the applicable column.
2. Answer all questions both in Section A and B.
3. Answer questions correctly and do not write your name on the questionnaires
4. The result of these research will be available towards the end of November 2020.
5. This questionnaire may only be completed by someone who lived in Walvis Bay informal settlement for more than 6 months.

Your participation in this study will be highly appreciated.

Yours truly,

J PL Nghihangwa

Annexure C: Questionnaire

SECTION A

Question1: Please tick the appropriate box

Demographic Data of the participants

1. Gender

| | |
|--------|--|
| Female | |
| Male | |

2.Age category

| | |
|------------|--|
| 18-39 yrs. | |
| 40-64 yrs. | |
| 65+yrs | |

3. Educational level

| | |
|------------|--|
| Uneducated | |
| Educated | |

4.Employment status

| | |
|------------------------|--|
| Employed | |
| Recently unemployed | |
| Never employed | |

5. Marital status

| | |
|----------------|--|
| Married | |
| Not married | |

6. Ethnicity

| | |
|-------------|--|
| Aawambo | |
| Damara Nama | |
| Ovaherero | |
| Kavango | |

| | |
|----------------------------------|--|
| Caprivian | |
| Ovahimba | |
| Khoi-San | |
| Others (please specify) _____ | |

7. Years lived in Walvis Bay

| | |
|-----------------|--|
| 6 – 10 months | |
| Above 10 months | |

8. Sources of income

| | |
|-----------|--|
| Allowance | |
| Salary | |
| None | |

SECTION B

Question 2: Please answer all the following questions by X the correct answer(s)

2.1 Do you go to the clinic/ hospital when you are sick?

| | |
|-----|--|
| Yes | |
| No | |

2.1.1 if NO, why? choose more than one answer

| | |
|---------------------------------|--|
| Affordability | |
| Accessibility | |
| Health workers attitudes | |
| Traditional hospitals preferred | |

2.2 Did you receive health education from Ministry of health and Social Services regarding Hepatitis E Virus?

| | |
|-----|--|
| Yes | |
| No | |

2.3.1 if yes, did you understand the health education?

| | |
|-----|--|
| Yes | |
| No | |

2.4 Do you think Hepatitis E Virus is curable?

| | |
|-----|--|
| Yes | |
| No | |

2.5 Did you or anyone from your house suffer from HEV?

| | |
|-----|--|
| Yes | |
| No | |

2.6 What cultural beliefs do you practice? choose more than one or specify

| | |
|-----------------------------|--|
| Use of traditional medicine | |
| Shaking hands | |
| Eat together at one plate | |
| Use of traditional medicine | |
| Others , specify | |

2.7 Do you use the toilets provided?

| | |
|-----|--|
| Yes | |
| No | |

2.7.1 if NO, why? Choose more than one answer

| | |
|------------------------------|--|
| They are dirty | |
| Far from you | |
| Not enough | |
| Insecure (dark) | |
| You don't like using toilets | |
| You don't share a toilet | |

2.8 Do you use Hand sanitiser provided (ANOSAN)?

| | |
|-----|--|
| Yes | |
| No | |

2.8.1 If NO, why? Choose more than one answer

| | |
|--------------------------|--|
| It is far from you | |
| You do not like using it | |

| | |
|-------------------------|--|
| You don't know about it | |
| Others (specify _____) | |

THANK YOU FOR YOUR PARTICIPATION.

Translated questionnaire in Oshiwambo

Oshitopolwa A

Shanga mokakololo

1. uukakwashikekookantu

| | |
|------------|--|
| omunkiintu | |
| omulumentu | |

2.OOmvula

| | |
|------------|--|
| 18-39 yrs. | |
| 40-64 yrs. | |
| 65+yrs | |

3. Onkantu yelongo

| | |
|------------|--|
| inologwa | |
| uulongelwe | |

4.iilonga

| | |
|----------------------------|--|
| halonga | |
| Opo akanitha iilonga | |
| Ina longa nale | |

5. Ondjokana

| | |
|-----------|--|
| Ahokana | |
| Inahokana | |

6. Uukwamuhoko

| | |
|--------------------|--|
| Aawambo | |
| Damara Nama | |
| Ovaherero | |
| Kavango | |
| Caprivian | |
| Ovahimba | |
| Khoi-San | |
| Oshikwawo (shanga) | |
| _____ | |

7. Oomvula wa kala Walvis Bay

| | |
|-----------------------|--|
| Oomwedhi 6 – 10 | |
| Pombanda yoomwedhi 10 | |

8. Onzo yiyemo

| | |
|------------------|--|
| Openzela | |
| Ofuto yokomwedhi | |
| Ihaa monosha | |

Oshitopolwa B

2.1 Ohoyi koshipangelo ngele to ehama?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.1.1 Ngele Ahawe, Omolwashike?

| | |
|---------------------------------------|--|
| Ondando yomayakulu goshipangelo | |
| Uukule woshipangelo | |
| Omaihumboto gaayakuli moshipangelo | |
| Omayakulo gopamuthigululwakalo | |

2.2 Owamona elongo lopaundjolowele Kombinga yomukithi Gwehuli okuziilila Kuuministeli wuuhaku?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.3.1 Ngelo Osho , elongo ndino oweli uvako nawa?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.4 Omukithi Gwehuli otagu vulu okupangwa ?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.5 owa ehama nale omukithi Gwehuli nenge omupambe gwoye ?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.6 omaitaalo ngeni hamulongitha ? yamukula eyamukulo livulithe pu limwe

| | |
|---------------------------------------|--|
| Okulongi iihemba yopamuthigululwakalo | |
| Oku iminika ngele to mu popithathana | |
| Okulila moshiyaha shimwe | |
| Ohikwawo, shanga | |
| | |

2.7 Ohamu longitha uundjugo wagandjwa?

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.7.1 Ngele hasho , kuthapo shimwe ?

| | |
|-------------------------------------------|--|
| Owakaka | |
| Owu li kokule | |
| Inawu gwana | |
| Kauna etonatelo (kwaluudha uusiku) | |
| Kandi hole okulongi okandjugo | |
| Ihandi longitha okandjugo naantu yalwe | |

2.8 Oha mu longitha , omeya gokudhipanga oombakiteli koonyala

| | |
|-------|--|
| Eeno | |
| Ahawe | |

2.8.1 Ngela Ahawe , kuthapo eyamukulo livulithe pulimwe

| | |
|--------------------------|--|
| Oyili kokuthe natse | |
| Kandi hole okuyilongitha | |
| Ina ndiyi uva nale | |
| Shikwa (shanga) _____ | |

Tangi unene kekuthombinga !

Annexure D: Interview guide for HEV sufferers

Title: Cultural beliefs on the predictors of hepatitis E virus and its preventative strategies in Walvis Bay, Erongo region, Namibia

Items required:

- Research Proposal
- Pens (blue or black)
- Writing Pads
- Interview guide form
- Comfortable place

Introduction:

Greet the participant and introduce yourself (Name and surname and work place)

Explain the aim of interview that the interview is voluntary

Obtain the verbal consent from the participant him/herself

Explain to the participant that the results of the study will be used only for the stated purposes

Find out the age of the participant (age category) and the address.

Interview questions will be as follows:

What do you think about HEV and HEV treatment?

Did you receive health education on HEV (causes, transmission and prevented measures)

From MoHSS and how good or poor was it? What cultural practices are important to you and how do those practices impact the treatment of Hepatitis E virus? Think of your ethnicity, race, or beliefs, have you ever been treated differently from others due to that at the clinics/hospital or in your community and how did this affect you? What things about you as a person (thoughts, feelings, behaviours, attitudes) prevented you from using hand sanitizer (ANOSAN), toilets, going to the hospital? Tell me about some traditions, celebration, or rituals your family practice. e.g., washing hands, using a toilet, and eating, using of modern medicine vs traditional once, shaking hands, sharing of toilets. In what way (if any), the actions, reactions, comments, or attitudes of some people prevented from washing your hands, taking your medicine, and using the toilets? Think of your financial situation, the community you live in, the work environment, where you socialize and the medical service you receive. In what way (if any) these things or environment prevented you from going to the hospital,

take medicine, using hand sanitizers or washing your hands? Think of things such as your culture, religion, and discriminations. In what way (if any) these prevented you from washing hands, taking medicine, or going to the hospital? Is there anything that you would like to add about your experience of suffering from HEV, the treatment and the recovery process?

Annexure E: Interview guide for health care workers

Requirements and informed consent same as above

Interview questions will be as follows: What do you think are the main cultural practices of the community when it comes to health care treatment of HEV and what are those? How do you think things such as income, age group, gender, ethnicity affects patient's treatment? Think of the HEV treatment, what do you think there are difficulties on health care management of HEV? What is your view on the efforts made by the Namibian Government such as community health education, the use of Hand sanitizer (ANOSAN), running water and toilets, ...how did these impact the community? Is there anything that you would like to add about your experience on dealing with patients suffering from HEV, the treatment and the recovery process?

Thank you for participating in the study.

Annexure F: Interview responses for both Health care workers and HEV sufferers

| Questions (Health care workers) | Responses |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What do you think are the main cultural practices of the community when it comes to health care treatment of HEV and what are those? | <p>Respondent 1: "When Damara Nama people develop yellow eyes, they drink herbs such Oukoreb, Kamaku! Nara! nomab, ginger, and garlic that they believe that they detox the body and cure HEV"</p> <p>Respondent 2: "Most of the Aawambo speaking people believe in eating sugar or red jam or drinking urine when they start to develop HEV signs and symptoms</p> <p>Respondent 3: "A lot of HEV patients will tell you that they started treating themselves either by eating sweet things especially sugar before coming to the clinic "</p> <p>Respondent 4: "Some patients go for traditional massages especially if they experience epigastric pain due to the HEV infection"</p> <p>Respondent 5:" Some patients have said that they used boiled garlic and ginger to treat themselves once jaundice started but they only came to seek medical care as the symptoms persisted"</p> <p>Respondent 6: "I don't know; I have not asked the patients what cultural practices they practiced before seeking care. Come to think of it would be interesting to know"</p> <p>Respondent 7: "I think one patient said he was told to stop eating fatty things that they are the cause of jaundice"</p> |

| | |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Respondent 8: “One patient told us, he was advised by elders to get a lot of sunshine as they jaundice is due to lack of sunshine”</p> <p>Respondent 9: “The clients that are from the villages are more likely to consult the traditional healers to seek help before coming for medical care.”</p> <p>Respondent 10: "It is hard to say, clients don't share such information with us"</p> |
| How do you think things such as income, age group, gender, ethnicity affect a patient's treatment? | <p>Respondent 1: "More young pregnant ladies tend to seek medical attention compared to men".</p> <p>Respondent 2: “ladies stay in the hospital until discharged by the Doctor compared to man”.</p> <p>Respondent 3: "Self-employed and casuals (employed on fixed-term) patients are less likely to finish the hospitalization period as they do not have income flow, therefore income flow determines how long a patient is willing to stay in the hospital until they fully recover".</p> <p>Respondent 4: “I think Aawambo people are more likely to seek medical care than the other tribes”</p> <p>Respondent 5: “Sometimes the unemployed patients can be seen by the doctor at the clinic and admitted. But because they don’t have enough funds to come to the hospital, they will stay home for days or a week while they, gather the taxi fare and hospital payments before coming to the hospital”</p> <p>Respondent 6:” I don’t know really but maybe more ladies seek treatment compared to men.”</p> |

| | |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Respondent 7: "Younger man finish their hospitalization compared to women, even though women are more likely to seek care sooner, could be due to the household responsibility."</p> <p>Respondent 8: "I don't know."</p> <p>Respondent 9: "Damara-Nama people are less likely to complete their hospitalization and sign a refusal of treatment"</p> <p>Respondent 10: "I don't know."</p> |
| Think of the HEV treatment, what do you think are the difficulties in health care management of HEV? | <p>Respondent 1: "It is difficult to house our patients until they recover due to limited space in health facilities, and this encourages them to seek cultural preferences"</p> <p>Respondent 2: "Laboratories take long to test for HEV, and this delays the treatment process".</p> <p>Respondent 3: "It is difficult to treat patients with co-morbidities as a lot of medicine used to treat HEV symptoms are contra-indicated and this requires the second level, and this delays the treatment process".</p> <p>Respondent 4: "It is hard to keep patients in them especially when they don't have any pain, some take it as a waste of time"</p> <p>Respondent 5: "There is currently no vaccine to help prevent clients from contracting the HEV. Patients have to have Liver function tests done sometimes every 2nd day especially when the Liver function test results are deranged"</p> <p>Respondent 6: "Currently we are only giving patients symptomatic care, we give medication</p> |

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| | <p>based on the signs and symptoms that the client presents. But we don't have medication to bring down the abnormal liver counts"</p> <p>Respondent 7: "Sometimes the health care facilities don't have Intensive care units to give the supportive treatment for the mother locally and they end up being transferred to Windhoek for further management"</p> <p>Respondent 8: "There is no specific medication to cure HEV, asymptomatic patients receive no treatment at all they just wait for the body's immune system to kick in. Sometimes severe liver disease set in that can be difficult to manage. Sometimes the medications for treating the symptoms is also not available"</p> <p>Respondent 9: "There are not enough isolation rooms for the positive patients while they receive treatment. The patients have to be housed in a separate single cohort room, using a separate toilet with hand hygiene supplies always available. This is to prevent nosocomial infection of HEV in the health care setting"</p> <p>Respondent 10: "It is especially difficult when patients wait at home with ailments until they get worse. Some clients come at home in a hypoglycaemic coma"</p> |
| What are your views on the efforts made by the Namibian Government such as community health education, the use of Hand sanitizer (ANOSAN), running water and toilets, ...how did these impact the community? | Respondent 1: "Interventions by the Ministry of Health and Social Services, Local Authority and Non-Governmental Organisations have impacted the community positively as there is a bigger change as there are hand hygiene opportunities everywhere (tippy taps)" |

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| | <p>Respondent 2: “We are seeing a decline in HEV cases “</p> <p>Respondent 3: “The Local Authority provided mobile toilet and portable water points “</p> <p>Respondent 4: "Having working toilets and running water will help the community positively as the accessibility of water will help so many of them not to wash hands in the same water."</p> <p>Respondent 5: "ANOSAN was made readily available to the community, but the community is not accepting it until the COVID-19 pandemic hit us in 2020"</p> <p>Respondent 6: “ANOSAN was given for free to the community but that has finished. Tippy taps have been made available in the areas where the HEV outbreak was declared, and the community has welcomed this idea. Most households have taken the responsibility of refilling and maintaining the tippy taps. This can be an indication that members of the community want to improve their hand hygiene practices.”</p> <p>Respondent 7: "We used to give ANOSAN to the patients to use as a hand rub. This impacted them positively as they could clean their hands even when they didn't have tap water, ANOSAN was also recommended for use to purify water for those that use so patients could clean their water before drinking it. Closed tippy taps keep water clean for hand hygiene so the community members that don't have running tap water can still safely wash their hands."</p> <p>Respondent 8: “Some of the community members</p> |
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| | <p>cannot afford to spend money on hand hygiene supplies, these provisions will help them positively to trust the government”</p> <p>Respondent 9: “I think these provisions have had a positive impact as the households maintaining the tippy taps means they are embracing the efforts of the government.”</p> <p>Respondent 10: "I don't know."</p> |
| Is there anything that you would like to add about your experience in dealing with patients suffering from HEV, the treatment, and the recovery process? | <p>Respondent 1: “Hepatitis E can be prevented if we employ good hygiene all the time”</p> <p>Respondent 2: “the monitoring of hepatitis E patients is costly”</p> <p>Respondent 3: “Sometimes the recovery takes long but patience should at least finish their treatment and monitoring so that they can have a better chance of recovering.”</p> <p>Respondent 4: “Not that I can think of now.”</p> <p>Respondent 5:" Hepatitis is still fairly new and unknown to the Namibian community, so community engagement and information is very much needed."</p> <p>Respondent 6: “Some patients still don’t understand the long-time damage that hepatitis E has on the body especially if it leads to liver failure”</p> <p>Respondent 7: “Maybe if they can come up with a medicine that can treat and improve the recovery rate of patients”</p> <p>Respondent 8:" the client needs to seek care sooner so they don't become dehydrated. Dehydration can</p> |

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| | <p>be fatal especially in those with other underlying ailments"</p> <p>Respondent 9: "It's hard to pinpoint now."</p> <p>Respondent 10: " Not really"</p> |
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| HEV Sufferers | Responses |
| <p>What cultural practices are important to you and how do those practices impact the treatment of Hepatitis E virus?</p> | <p>Respondent 1: "When I got yellow eyes, I started eating sugar as I was told by my grandmother. I only went to the hospital when body pains initiate "</p> <p>Respondent 2: "When I start getting sick I went to the hospital and got admitted but later I went to seek help from traditional healers because I did not get better"</p> <p>Respondent 3: We wash our hands in one bucket before we start to eat and during bereavement ceremonies and eat all of us at one plate as we were raised".</p> <p>Respondent 4: "In our culture, we greet each other by shaking hands especially if we have not seen each other for some time, this only changed when COVID-19 starts "</p> <p>Respondent 5: "I tried to take some herbs to help with the stomach discomfort I had but it did not help at all. My eyes and hands and feet just got more and more yellow."</p> <p>Respondent 6: "I went for a traditional massage to assist with the stomach pain and the pain got better but it took about 3 weeks for me to get better"</p> <p>Respondent 7: "I took herbs for the yellow eyes but</p> |

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| | <p>they made me nauseous (I thought it was detoxing me) and I ended up getting dehydrated. At that point, I went to the hospital and was admitted"</p> <p>Respondent 8: "I was informed not to eat any citrus as it will make jaundice worse and get a lot of sunlight but that also did not work for me"</p> <p>Respondent 9: "I don't try any traditional practices, I just drank lots of fluids because my urine was dark and then my eyes and hands started turning yellowish. That is when I went to the hospital, I was treated and monitored as an outpatient."</p> <p>Respondent 10: "I suffered from fatigue and body aches, I drank herbs to gain my strength. They made me feel better. But when I got to the hospital I was informed my blood results were not looking good and I got admitted"</p> |
| Think of your ethnicity, race, or beliefs, have you ever been treated differently from others due to that at the clinics/hospital or in your community and how did this affect you? | <p>Respondent 1: "I have not been treated differently based on my ethnicity, but when I told the health providers how long I had been treating myself at home they were a bit skeptical."</p> <p>Respondent 2: "I was helped well when I arrived at the clinic to seek care and got admitted but it took a long for the symptoms especially jaundice to get better. I had to leave the hospital to get treated by my traditional healer."</p> <p>Respondent 3: The nurse and doctor that assisted me were of my ethnicity so they understood what I was saying. I was treated with dignity. The health education they gave me was helpful and that impacted positively to implement hand hygiene and other hygienic practices at home.</p> |

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| | <p>Respondent 4: “I didn’t notice that they treated me differently, I was treated the same. I was given health education on hand hygiene in words I understood too.</p> <p>Respondent 5: “They scolded me a bit because I took long to seek medical help but not because of my race or ethnicity”</p> <p>Respondent 6: "The health care workers did not understand why I would go to traditional massage. They made me wait long in the queue I think they treated me differently because they did not understand my cultural practice. I felt so bad."</p> <p>Respondent 7:” I don’t think so.”</p> <p>Respondent 8: "They laughed when I told them the remedies I had been using. I felt silly but they didn't treat me badly. It didn't impact me in any way."</p> <p>Respondent 9: "The way the nurses treated me had nothing to do with my beliefs and race but they were concerned about the implications of my chosen treatment. They gave me health education and medication and it impacted me positively"</p> <p>Respondent 10: “The HCW made me feel like I was backward because of the chosen method of treatment, like because I did not come to the hospital as soon as possible. But it didn’t change anything, ”</p> |
| In what way (if any), the actions, reactions, comments, or attitudes of some people prevented you from washing your hands, taking your medicine, and using the toilets? | <p>Respondent 1: “The actions of others don’t prevent me from doing things at all.”</p> <p>Respondent 2:” those have no impact on me”</p> |

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| | <p>Respondent 3: “those toilets are dirty”</p> <p>Respondent 4: “We collect water in buckets, sometimes the people I stay with say comments like I am wasting water if I use the water for washing hands”</p> <p>Respondent 5:” At night I am afraid to go use the toilet because it’s not safe to walk so far in the dark”</p> <p>Respondent 6: “It does not prevent me from doing any of those things but sometimes I feel I would rather use the small water I have for cooking or something other than washing my hands”</p> <p>Respondent 7:” I am afraid to go the toilet at night because I heard people saying that it is dangerous”</p> <p>Respondent 8: “In no way at all”</p> <p>Respondent 9: "it does not affect me"</p> <p>Respondent 10: “it has not prevented me”</p> |
| Think of your financial situation, the community you live in, the work environment, where you socialize, and the medical service you receive | <p>Respondent 1: We pay double tax fair when we are referred to the State Hospital”</p> <p>Respondent 2: “The clinic is far from us and we usually do not have money as you see we are unemployed “</p> <p>Respondent 3: “I am unemployment and I don’t have money to go to the hospital”</p> <p>Respondent 4: “I did not go for a follow-up because of tax money and I am unemployed “</p> <p>Respondent 5: "We are very poor here at Otweya, a</p> |

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| | <p>lot of us lost our job and we are struggling financially"</p> <p>Respondent 6:" The tax fair to the State hospital is too much and I struggled to reach there".</p> <p>Respondent 7:" I am very poor, and I am living in a very decapitated shack “</p> <p>Respondent 8:" I lost my job 3 years ago and I am struggling financially, even tax money to go to the clinic is difficult to get".</p> <p>Respondent 9:" Financially I am poor; I do not earn any income”</p> <p>Respondent 10:" I am a casual worker at the factories and I don't work every day, therefore, the salary is very thin "</p> |
| Is there anything that you would like to add about your experience of suffering from HEV, the treatment, and the recovery process? | <p>Respondent 1: “I have nothing to add about my experience”</p> <p>Respondent 2:" My experience with HEV taught me the importance of hand hygiene. Traditional medicine is also a good alternative”</p> <p>Respondent 3: “We wash our hands in the same bucket and use the same hand towel to dry our hands. This experience showed me how our practices put us at risk.”</p> <p>Respondent 4: "Culturally we are taught to wash our hands before we eat and after we use the toilet, so my culture is one of the hygienic practices. But we wash our hands in the same bucket and we eat together."</p> <p>Respondent 5: “It is difficult to survive here in</p> |

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| | <p>Walvis Bay when you are sick especially when you are unemployed like me. I struggled a lot in terms of finances”</p> <p>Respondent 6:</p> |
| <p>Did you receive Hand sanitizers and health education on HEV (causes, transmission and prevented measures) From MoHSS, and how good or poor was it?</p> | <p>Respondent 1: "I have never received health education, not even a hand sanitizer"</p> <p>Respondent 2: “I did not see people in our community giving health education on HEV”</p> <p>Respondent 3:” I do not know how I got HEV and how to prevent it”</p> <p>Respondent 4: “I did not see people from MoHSS at my house giving health education although I was admitted.”</p> <p>Respondent 5:” I don’t remember receiving health education at the health care facility but I remember seeing a pamphlet from the municipality on do’s and don’ts”</p> <p>Respondent 6: “The nurses did not give me any health education at the hospital “</p> <p>Respondent 7:” I never get education on the disease transmission and preventative measures and I have never heard of people being given hand sanitizers by the MoHSS “</p> <p>Respondent 8: "Culturally you can't just go to the hospital for everything, sometimes we try to treat ourselves before we go to seek care."</p> <p>Respondent 9: “I was not given health education”</p> <p>Respondent 10: "I was not given health education at the hospital or my house "</p> |

Annexure G: Permission letter from the MoHSS to carry out a study.



REPUBLIC OF NAMIBIA

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OFFICE OF THE EXECUTIVE DIRECTOR

Ref: JPLN 0000
Enquiries: Mr. A. Shipanga

Date: 05 December 2020

Mr. /Ms. Justin Ngihengwa
P.O. Box 2203
Walvis Bay

Dear Mr. /Ms. Ngihengwa

Re: Academic Research Proposals Approval – NUST – Masters of Health Sciences.

Title: An ethnographic study of predictors of Hepatitis E (HEV)
and its preventative strategies in Walvis Bay, Erongo Region,
Namibia.

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
 - 3.1 The data to be collected must only be used for completion of your Masters of Health Sciences;
 - 3.2 No other data should be collected other than the data stated in the proposal;
 - 3.3 No any specimen should be collected from Human Subjects;

- 3.4 Stipulated ethical considerations in the protocol related to the protection of Human Subjects' information should be observed and adhered to; any violation thereof will lead to termination of the study at any stage;
- 3.5 A quarterly report to be submitted to the Ministry's Research Unit;
- 3.6 Preliminary findings to be submitted upon completion of the study;
- 3.7 Final report to be submitted upon completion of the study;

3.8 Separate permission should be sought from the Ministry for the publication of the findings.

4. All the cost implications that will result from this study will be the responsibility of the applicant and not of the MoHSS.

Yours sincerely,


BEN NANGOMBE
EXECUTIVE DIRECTOR



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Annexure H: Turnitin report

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Annexure I: Certificate of English Editing and proofreading



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CERTIFICATE OF ENGLISH EDITING AND PROOFREADING

Linked Investments Cc (CC/2016/00419)

3 October 2021

To whom it may concern,

This is to certify that the manuscript for the Master in Health Sciences, titled: "An Ethnographic Study of Predictors of Hepatitis E Virus (HEV) and its Preventative Strategies in Walvis Bay, Erongo Region, Namibia", to be submitted by Ms Justina P L Nghihangwa to the Namibia University of Science and Technology (NUST), Republic of Namibia, has been edited for language and proofreading by Linked Investments CC, under the Division of Author Services.

The Editor herewith certify that, either the research content nor the author's intentions were altered in any way during the editing process.

Linked Investments CC guarantees the quality of English language and proofreading in the stated manuscript, provided our Editor' suggested changes are accepted and further made to the document are checked by the author.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Lisho', with a stylized circular flourish to the left.

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